

SCADAview® CSX

User's Manual

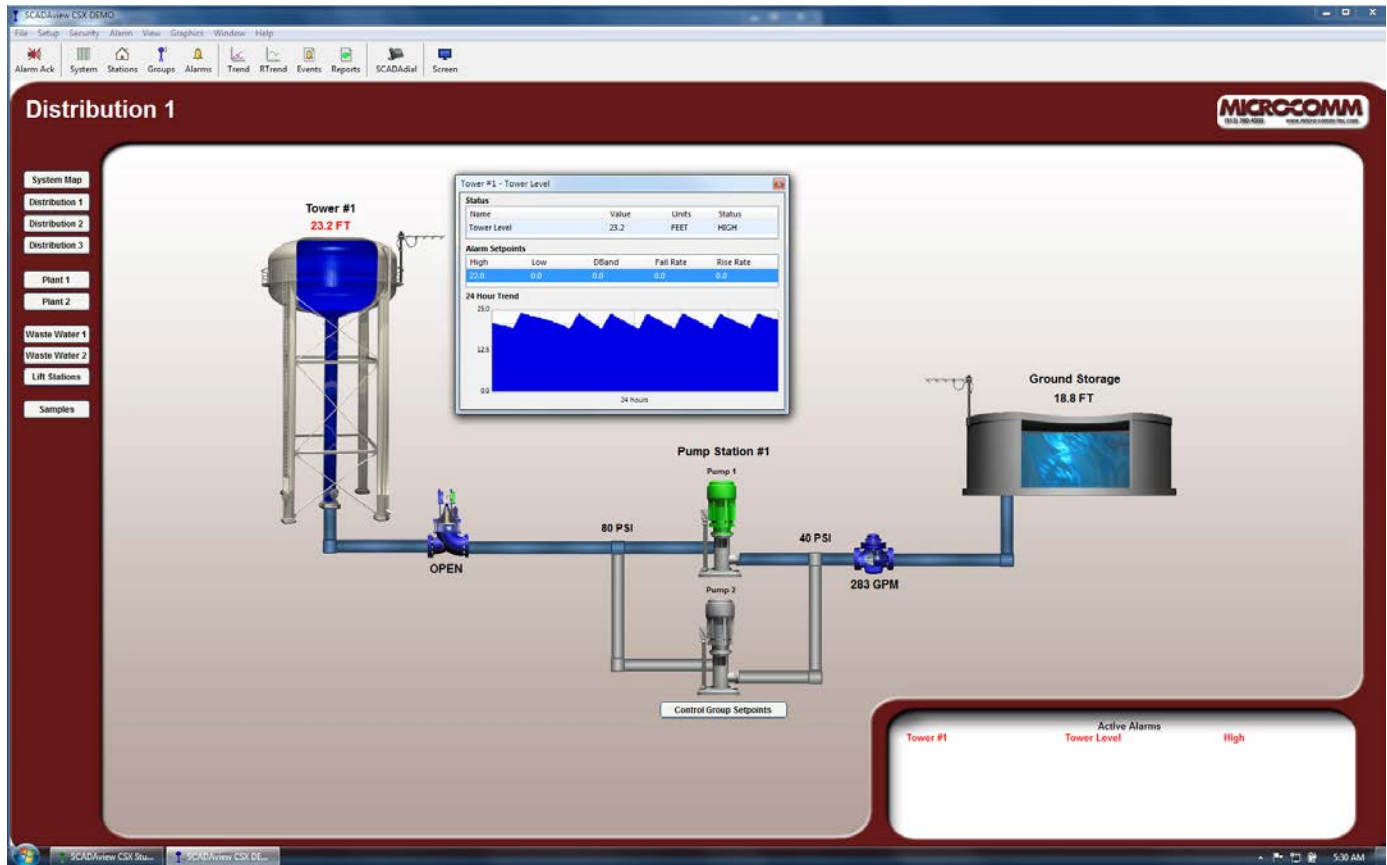
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Main Graphics Viewer

The main SCADAview CSX display window normally provides a graphical overview of the system (depending on how it was set up). An example is shown below:



The toolbar at the top allows access to various standard (text based) displays and reports as well as navigation to other graphics screens. The statusbar at the bottom shows who is currently logged in, how many alarms are still active and whether or not the connection is good to the server. The example above also shows a toolbar button for the optional "SCADA Dial" add-on along with the status message showing that it is currently disabled.

Other graphic viewer windows may be open at the same time and placed on other monitors if desired. Open a new graphic viewer by selecting "New Window" or "New Floating Window" from the Graphics menu. These additional windows will re-open automatically when the program is launched and will remember their placement (as all other standard windows do). If windows can no longer be seen due to changing the placement or removing monitors, select "Gather Windows" from the Window menu and they will all be pulled back to the primary display.

The operation of the custom graphical windows will be different depending on the system. The remainder of this manual describes the operation of the standard display screens, since their operation is somewhat generic no matter how the system was set up graphically.

Another option available is to disable the graphics in the main viewer. Graphics would only then be available when showing the separate graphics window by selecting "New Window" or "New Floating Window" from the Graphics menu.

System Display

System Display #1 - Entire System																				
Station Name	AI1		AI2		AI3		Flow Rate		Flow Total		24hr Total		D11	D12	D13	D14	D15	D16	D17	D18
Tower #1	LVL	21.3 FEET											AVR							
Pump Station #1	DP	80.0 PSI	SP	40.0 PSI			FR	283.0 GPM	FT	10,234,000 GAL	FT	24,000 GAL	P1R							
Ground Storage	LVL	20.7 FEET		0.0																
Raw Water Pumps	LVL	0.0 FEET	FR	0.0 GPM																
Lift Station #1	LVL	0.0 FEET																		
High Service Pumps	DP	72.0 PSI	LVL	54.0 INCH	V8S	76.8 %							P8R							
Rapid Mixer's	M1S	0.0 %	M2S	0.0 %	CL2	0.675 mg/L									PLR					
Flocculator #3-#6	F3S	0.0 %	F4S	0.0 %	F5S	0.0 %														
Flocculator #7-#10	F7S	0.0 %	F8S	0.0 %	F9S	0.0 %														
Influent Chlorine	CL2	0.63 mg/L	CF1	0.0 %	CF2	0.0 %	FR1	0.0 ppd	FT1	0 lbs	FT1	0 lbs								
Feeder #6 - #10	PH	7.3 PH	STR	0.0 VAL	LVL	0.0 FT														
Plant Influent Valve	POS	74.3 %	TUR	0.27 NTU	TMP	68.3 degF	FR	320.0 GPM	FT	0 GAL	FT	0 GAL	I1R							
Plant Influent Contr	PRC	0.0	PCV	0.0																
Backwash Pumps	DP	0.0 PSI	P5S	0.0 %	P6S	0.0 %	FR	0.0 GPM	FT	0 GAL	FT	0 GAL								
Clearwell & Ammonia	LVL	14.3 FT	GAS	0.0 ppm			FR	0.0 ppd	FT	0 lbs	FT	0 lbs								
High Service Control	CMD	0.0 %			DMD	0.0 KW/hr	PWR	0.0 KW/HR	PWR	0 KW	PWR	0 KW								
Finished Water	CL2	0.0 mg/L	CL2	3.55 mg/L	TUR	0.03 NTU	FR	4,274.0 GPM	FT	0 GAL	FT	0 GAL								
Tower #1 - Tower Level = 21.3 FEET																				

The System Display windows provide an overview of the entire system (or part of a system) in the form of a spreadsheet. Columns in this spreadsheet will display the station name, levels and status inputs along with the appropriate alarm/status background color.

Station Name

All station names currently selected for display will appear in the first column and will have a gray background color. The background color will be different whenever the user has added a station note with a special color. The text color will change to Red if the station is in Loss-Of-Signal.

Analog Input Columns

Analog Input levels will be displayed in the next 8 columns if they are selected for display. Column labels will be AI1-AI8 by default. The background color will change based on the alarm status for that input.

Flow Rate/Total Columns

The next 3 columns are used for Flow Rate, 24 Hour Flow Total and Flow Total. The background color for these will change based on the flow rate/total alarm status.

Discrete Input Columns

All discrete inputs selected for display will be shown next in the spreadsheet. Column labels for the first six inputs will default to D11-D16 and the expansion module inputs will default to E11-EI32.

Controlled outputs such as pumps will be set up as "Call/Run/Fail" so that a label will be changed based on the pump's status (i.e. P1R for pump #1 Run, P1C for pump #1 Call, and P1F for pump #1 Fail).

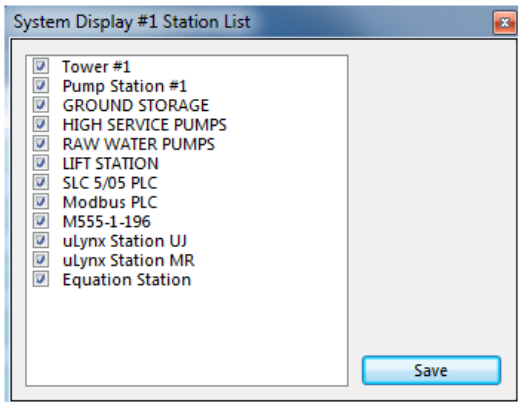
Status inputs will show their label whenever they are on along with the status color as the background.

System Display Station List

By clicking the right mouse button on the system display, the following options can be selected depending of the option clicked on:

Right-Click and select “Station List...”

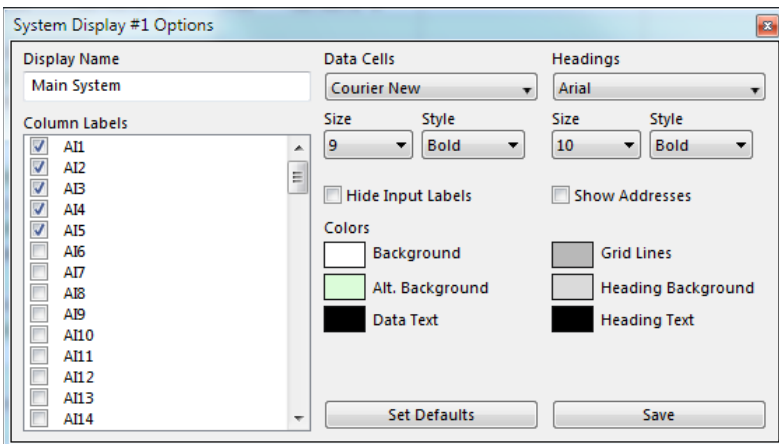
A selection window showing all the stations in the system will be displayed. Click on the checkbox next to the station name to show or hide a particular station. Close the setup screen when finished.



System Display Options

Right-Click and select “Display Options...”

A selection window showing the display labels and checkbox for each data column is shown. Changes can be made to the system display name, column labels, text styles and highlight color. Click on the checkbox to show or hide a particular column of data. Columns can also be re-ordered by clicking on Move Up or Move Down. Click Save to save all the changes.



Color options like the “Alt. Background” will bring up a screen that allows the alternating row color to be changed. Click on color desired and click OK to save the change.

Station Display & Control

Station Display

Name: Pump Station #1 Addr: PH

Notes

Name	Value	Units	Status
Discharge Pressure	70.9	PSI	FALL
Suction Pressure	64.7	PSI	RISE
PISB	45715.0		RISE
TIME(0)	27824.0		RISE
Test Pulse Rate	0.0	PPM	
BOX TEMPERATURE	972.0	DEG	FALL
Restarts	55.0	LV7	
Runtime (msec)	90.0	LV8	
AIB Level	716.0	ft	RISE
AII0 Level	27824.0	ft	RISE

Name	SYS	RTU	Mode	Status
Pump #1	Auto		Call	Run
Pump #2	Monitor		Standby	Off
Pump #3	Off		Disabled	Off
Bypass Valve	Off		Call	Run
LOW SUCTION				
POWER FAILURE				
Pump #7				RUN
Pump #8				RUN
CV FAIL 1				
CV FAIL 2				

Name	Value	Units	Status
Flow Rate	647.0	GPM	RISE
Flow Total	62,211,217,000	GLNS	RISE
24 hr Flow Total	29,555,000	GLNS	RISE
Flow Rate #2	1,091.0	GPM	FALL
Flow Total #2	2,200,658,000	GAL	RISE

Station Data	Status
RTU	Normal
CTU	Normal
Data Quality	Valid
Time Stamp	6:51:19a

The Station Display allows an operator to view all information and make changes to control parameters on a remote station.

Note – Making changes to setpoints is accomplished by selecting the proper tab, clicking once or twice in a text box, typing the new value and pressing “Enter” or clicking out of the text box.

Name

The name given to the remote station being displayed. Changing this selector or the ID selector will change the current station being viewed.

Addr

The 2-character address of the station being displayed (HH through WW).

Notes

Clicking on this button will bring up a text editor for typing notes related to the station. A status color can also be chosen in the editor that will be the background color for the station name on the System Display.

Information is presented in (4) separate tab panels that will show different items based on each tab selector. The following is a list of what each panel will do:

Upper left panel - Levels

This panel shows information related to analog input/output levels and settings. The name of each input used will appear on the left. The other columns will change based on the option being viewed:

Levels

Value The most recent level reading for the input
 Units The unit of measure i.e. PSI, FEET etc.
 Status The most recent status change or alarm (RISE, FALL, HIGH, LOW, RATE)

High/Low

High User setpoint for the high level alarm
 Low User setpoint for the low level alarm
 DBand Deadband for both the high and low level setting (level will have to fall/rise by this much before an alarm will clear)

Rate

Rise Rising rate-of-change alarm setpoint
 Fall Falling rate-of-change alarm setpoint

Note: The rate alarm setpoints are entered in units per 2 minute change interval. Alarm will generated if the level changes by more than this amount in 2 minutes.

Station Display

Name: Pump Station #1 Addr: PH Notes

Levels High/Low Rate Outputs

Name	High	Low	DBand
Discharge Pressure	250	0	4
Suction Pressure	0	0	0
PI58	0	0	0
TIME(0)	0	0	0
Test Pulse Rate	0	0	0
BOX TEMPERATURE	0	0	0
Restarts	0	0	0
Runtime (msec)	0	0	0
AI9 Level	0	0	0
AI10 Level	0	0	0

Discretes Expansion HOAs Maintenance Remote

Name	SYS	RTU	Mode	Status
Pump #1	Auto		Call	Run
Pump #2	Monitor		Standby	Off
Pump #3	Off		Disabled	Off
Bypass Valve	Off		Call	Off
LOW SUCTION				
POWER FAILURE				
Pump #7				OFF
Pump #8				RUN
CV FAIL 1				
CV FAIL 2				

Flow Rate/Total High/Low Flow Setup

Name	Value	Units	Status
Flow Rate	648.0	GPM	
Flow Total	62,211,419,000	GLNS	RISE
24 hr Flow Total	29,757,000	GLNS	RISE
Flow Rate #2	1,095.0	GPM	FALL
Flow Total #2	2,200,665,000	GAL	RISE

Station Status

Station Data	Status
RTU	Normal
CTU	Normal
Data Quality	Valid
Time Stamp	6:54:08a

Outputs

Value User setpoint for an output value sent to the remote - target setpoints, speed etc.

Units The unit of measure i.e. PSI, GPM etc.

Station Display

Name: Pump Station #1 Addr: PH Notes

Levels High/Low Rate Outputs

Name	Value	Units
TEST AO1	0.0	RPM
TEST AO2	0.0	
TEST AO3	0.0	
TEST AO4	0.0	
AO5 Setpoint	0.0	%
AO6 Setpoint	0.0	%
AO7 Setpoint	0.0	%
AO8 Setpoint	0.0	%

Discretes Expansion HOAs Maintenance Remote

Name	SYS	RTU	Mode	Status
Pump #1	Auto	Auto	Call	Run
Pump #2	Auto	Auto	Standby	Off
Bypass Valve			Standby	Off
LOW SUCTION				
POWER FAILURE				ALARM

Flow Rate/Total High/Low

Name	Value	Units	Status
Flow Rate	283.0	GPM	
Flow Total	10,234,000	GAL	
24 hr Flow Total	24,000	GAL	

Station Status

Station Data	Status
RTU	Normal
CTU	Normal
Data Quality	Valid
Time Stamp	2:02:28p
Date	5/21/2012

Upper right panel - Discretes

This panel shows information related to discrete inputs at the remote station. These inputs are used as status/alarm inputs i.e. Pump Run, pressure alarms etc. In addition to viewing the status of the inputs, controlled discrete outputs may be changed between Hand, Off, and Auto.

Discrete Inputs

SYS

System HOA status. This is the final decision combination of all other HOAs in the system. It will show either HAND, OFF or AUTO for each controlled device.

RTU

Remote monitored HOA status when used. The remote station would be wired with an HOA whose status will be reported back to the CTU using the Expansion Inputs.

Mode

The current mode of a controlled output (pump). Four modes are possible:

Standby	the controlled device is off, in auto and available for use
Disabled	the controlled device is currently disabled or the HOA is off
Fail	device has failed to run
Call	device is being called on by the CTU

Status

The current status of the input. Pumps will always show either OFF or RUN in this column. Other discrete inputs will display a user-defined label when an input is on.

Name	Value	Units	Status
Discharge Pressure	40.8	PSI	
Suction Pressure	24.8	PSI	
Discharge If Greater than 50	40.8	PSI	
TIME(0)	52,042.0		
Test Pulse Rate	17.0	PPM	
PLC Temperature	1,051.736	DegF	
Restarts	357.0	LV7	
Runtime (msec)	90.0	LV8	

Name	Value	Units
Flow Rate	248.0	G
Flow Total	1,092,511,000	G
24 hr Flow Total	1,188,000	G
Flow Rate #2	2,098.0	G
Flow Total #2	7,181,751,000	G
24 hr Flow Total #2	1,934,000	G

SYS HOA	Mode	Status	Hours	Cycles
AUTO	CALL	RUN	4,142.2	5,368

Hand/Off/Auto Controls - Pump Control Panel

Double-clicking in the the Position or discretes status column will bring up an individual pump's control panel / HOA (Note: The pump control panels can be globally enabled or disabled in application preferences). Pump control panels show the control status, event log and expanded output status (when available) for the controlled device.

Hand/Off/Auto Controls - Read All Option

If no pumps are selected, all HOA's can be read and displayed with dropdown selectors:

HOA Selectors

User selection for the mode of each controlled device:

HAND - turns the device ON

OFF - turns the device OFF

AUTO - lets the system control the device based on stop/start setpoints

Note: Other selection options may be available (i.e. OPEN/CLOSE, ON/OFF etc.)

Station Display

Name: Pump Station #1 Addr: PH Notes

Levels: High/Low Rate Outputs

Name	Value	Units	Status
Discharge Pressure	80.0	PSI	
Suction Pressure	40.0	PSI	
Temperature	75.0	DEG	

Discretes Expansion HOAs Maintenance Remote

Name	Status
PUMP 1 HAND	
PUMP 1 AUTO	P1A
PUMP 2 HAND	
PUMP 2 AUTO	P2A
PUMP 3 HAND	
PUMP 3 AUTO	
DOOR OPEN	
OPER PRESENT	

Flow Rate/Total High/Low

Name	Value	Units	Status
Flow Rate	283.0	GPM	
Flow Total	10,234,000	GAL	
24 hr Flow Total	24,000	GAL	

Station Status

Station Data	Status
RTU	Normal
CTU	Normal
Data Quality	Valid
Time Stamp	6:37:32a

Expansion Inputs

Expansion inputs are additional discrete inputs usually located on an external input module at the RTU. The name and the input status are displayed for each device. On/Off labels are displayed for the status if they have been entered, otherwise the input label is displayed whenever the input is on.

Station Display

Name: Pump Station #1 Addr: PH Notes

Levels: High/Low Rate Outputs

Name	Value	Units	Status
Discharge Pressure	70.0	PSI	RISE
Suction Pressure	50.0	PSI	RISE
Temperature	75.0	DEG	RISE

Discretes Expansion HOAs Maintenance Remote

Name	Hours	Alarm	Cycles	Alarm	Date
Pump #1	25.6	500.0	18	0	3/31/2013
Pump #2	30.1	500.0	20	0	3/31/2013
High Discharge	0.0	0.0	0	0	
Bypass Valve	0.0	0.0	0	0	
Low Suction	0.0	0.0	0	0	
Power Fail	0.0	0.0	0	0	
Entry Alarm	0.0	0.0	0	0	
Station Flood	0.0	0.0	0	0	

Flow Rate/Total High/Low

Name	Value	Units	Status
Flow Rate	0.0	GPM	
Flow Total	10,234,000	GAL	RISE
24 hr Flow Total	24,000	GAL	RISE

Station Status

Station Data	Status
RTU	Normal
CTU	Normal
Data Quality	Valid
Time Stamp	5:59:09a
Date	3/18/2013

Pump Maintenance

The current number of runtime hours and pump cycles can be entered here for each discrete input along with alarm setpoints. The runtime will automatically increment in tenths of hours whenever the discrete input is "ON" and the cycle count will increment whenever the discrete input goes from off to on. When the runtime or cycles reaches the setpoint, a "Runtime Alarm" or "Cycle Counter Alarm" is generated. A "Next Service Date" alarm can also be selected for each controlled device by double-clicking in the Date column.

Flow Rate/Total Inputs

Value
The most recent flow rate / total readings.

Units
The unit of measure (usually GPM and GAL)

Status
Alarm status (HIGH, LOW)

Station Display

NamePump Station #1AddrPHNotes

Levels

High/LowRateOutputs

Name	Value	Units	Status
Discharge Pressure	80.0	PSI	RISE
Suction Pressure	40.0	PSI	FALL
Temperature	75.0	DEG	

DiscretesExpansionHOAsMaintenanceRemote

Name	SYS	RTU	Mode	Status
Pump #1	Auto	Auto	Call	Run
Pump #2	Auto	Auto	Standby	Off
Bypass Valve			Standby	Off
LOW SUCTION				
POWER FAILURE				ALARM

Flow Rate/TotalHigh/Low

Name	High	Low
Flow Rate	1,000.0	0.0
24 hr Flow Total	0	0

Station Status

Station Data	Status
RTU	Normal
CTU	Normal
Data Quality	Valid
Time Stamp	7:04:56a

Flow High/Low Alarms

High
User settings for HIGH flow rate or high 24hr total

Low
User settings for LOW flow rate or low 24hr total

Remote Station Commands

Poll Now

Clicking this button will cause the CTU to skip all the remaining stations in it's polling list and start over with the selected station.

Accumulators

Click this button to display a window that allows reading and writing of remote accumulator variables. These may be used for pump runtimes, flow totals etc.

Real-Time Clock

If the remote station is RTU32 or later, this will allow the station's clock to be read back and then set to match the PC's clock.

Totalizer

If the station is RTU32 or later and the flow total value is being computed out at the remote, this will allow the flow total value to be changed. Note: The totalizer is usually displayed in 1000 gallon increments.

The screenshot shows the 'Station Display' window for 'Pump Station #1'. It features several tabs: 'Levels', 'Discretes', 'Expansion', 'HOAs', 'Maintenance', and 'Remote'. The 'Levels' tab is active, displaying a table of sensor data. Below this, there are buttons for 'Poll Now', 'Real-Time Clock', 'Accumulators', and 'Totalizer'. At the bottom, there are two more sections: 'Flow Rate/Total' and 'Station Status'.

Name	Value	Units	Status
Discharge Pressure	70.0	PSI	
Suction Pressure	50.0	PSI	
Temperature	75.0	DEG	

Name	Value	Units	Status
Flow Rate	0.0	GPM	
Flow Total	10,234,000	GAL	
24 hr Flow Total	24,000	GAL	

Station Data	Status
RTU	Normal
CTU	Normal
Data Quality	Valid
Time Stamp	6:03:04a
Date	3/18/2013

Station Status

The Lower-Right panel will show all other status information related to the station.

RTU

The current status of the remote (Normal, Override or LOS)

Override means that a CTU has placed the remote in Override mode.

LOS means that the station has stopped responding. This also is displayed in the Data Status.

CTU

The current status of the central (Normal, Monitor or Override)

Monitor means that this CTU does not control the remote.

Override means this CTU has taken over control of the remote from the other CTU.

Data Quality

The status of all the displayed data from the remote.

Valid means that the data is less than 1 polling cycle old.

Old means the data is more than 1 polling cycle old.

LOS means the station has not responded for a programmed number of cycles.

Time Stamp

The central's time when the remote data was last received.

Date

The computer's date when the remote data was last updated.

Control Group Setpoints

The Control Group Setpoints window allows an operator to change the starting and stopping levels for any control group in the system. A “Control Group” is a collection of controlling levels (usually an analog input from a remote station such as a tank level) and controlled devices (usually pumps or valves at another station).

Note: Making changes to setpoints is accomplished by clicking in the text box, typing the new value and pressing Enter. Changing other parameters such as the Controlling Level Enables is done by just clicking the box to select the new mode. Pressing Enter is not required in this case. If the control group is located at the remote then buttons for Read / Send will appear above the setpoints that allow the operator to change the setpoints at the remote.

Name and

The name of the control group is shown and selected here. The control group can also be selected by #.

Control Setpoints

Normal control groups have up to eight sets of stop/start setpoints on this screen; the eight are shown down the left-hand side of the window. The stop/start setpoints are values entered by the operator to determine at what value the corresponding controlled device will either stop or start.

Alternator

Use the mouse to select the alternator sequence for the control group. The alternator determines the mode of operation for the controlled devices. The choices are:

Forward	Device one is always first
Reverse	Last device is always first
Auto	Alternation sequence beginning with the first device and continuing through all available devices
All	Same as Auto.

Reset

If a device fails, the system automatically chooses the next device available (in auto mode) to control. The system will not try the failed device again until the operator resets the failed device(s) by clicking on this button.

Time Clock Controls

Pre-Fill

Enter the pre-fill rate (feet per hour) at which the tank fills when the pump is running. It will be used to determine when the controlled device will come on prior to the time that inhibit is activated. This will allow the system to top-off the tank using the lead control level setpoint prior to inhibiting the control group. The pre-fill value is used whenever Time Inhibit/Restore operation is also enabled.

Time Inhibit

Enter a time in 24-hour time (i.e. 1:00 PM would be entered as 1300) and press Enter. The inhibit time is the time of day that the control group is inhibited from controlling any devices.

Time Restore

Enter a time in 24-hour time and press Enter to continue. The restore time is the time of day that the control group is put back in control again.

Override

Enter the stop and start values for which you want control to be reinstated temporarily for one controlled device during Time Inhibit because of a very low level. The stop setpoint determines when to inhibit the control again.

Controlling Level Enables

Use the mouse to toggle each of the eight controlling level ON or OFF. Each control group has corresponding controlling levels. These values determine when the device they control should turn on or off. All levels that are currently being used for control should be set to ON. The pumps or other controlled devices will run until the setpoints for ALL the levels selected are reached.

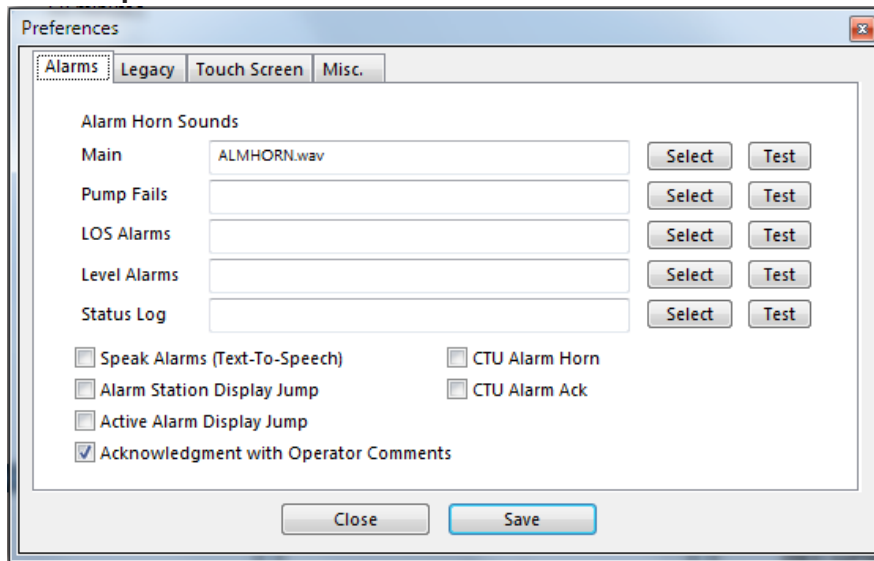
The scaling factor for the control group setpoints will also be determined based on which controlling level is selected.

Alarms

Acknowledging Alarms

To acknowledge alarms, press the F4 key or select the “Acknowledge All Alarms” option from the “Alarm” menu. The time, date, alarm description and current user name will be added to the event log.

Alarm Options



The Alarm Options are selected from then “Preferences...” item under the setup menu. These options allow an administrator to change the behavior of the alarm system.

Alarm Horn Sounds

The sounds selected will be played every 6.5 seconds whenever an alarm occurs and has not been acknowledged. Alarm sounds for Pump Fails, LOS Alarms and Level Alarms can be different from the main alarm sound. If these special alarm sound files are not selected, the main sound will be used instead. Select the .WAV sound files using the Select... button and then click on the “Test” button to try the sound.

Status Log Sound

The sound selected will be played once whenever a status event occurs.

Speak Alarms

All currently active alarms will be read (over and over) using the operating system’s text-to-speech engine.

Alarm Station Display Jump

When this option is turned on, the Station Display window will be opened to the alarming station when a new alarm occurs.

Active Alarm Display Jump

This will open the active alarms window whenever a new alarm occurs.

Acknowledgment with Operator Comments

This will allow the operator to type in some comments whenever an alarm is acknowledged. The comments will be logged to the alarm event log.

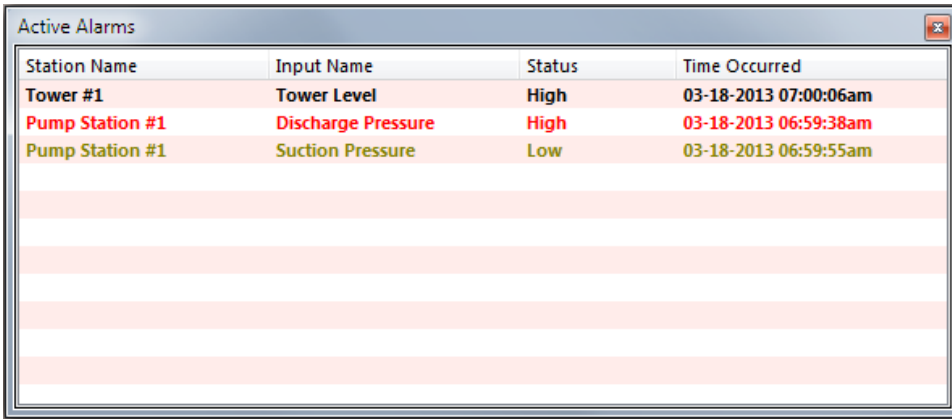
CTU Alarm Horn

When this option is turned on, the SV-PLC Server application will be told to turn ON the CTU alarm horn output bit whenever an alarm occurs. It will be turned back off when the operator hits Alarm Acknowledge.

CTU Alarm Ack

If this option is on, the CTU alarm horn will be silenced (an alarm ack bit will to momentarily turned on) whenever the operator hits Alarm Acknowledge.

Active Alarms Window

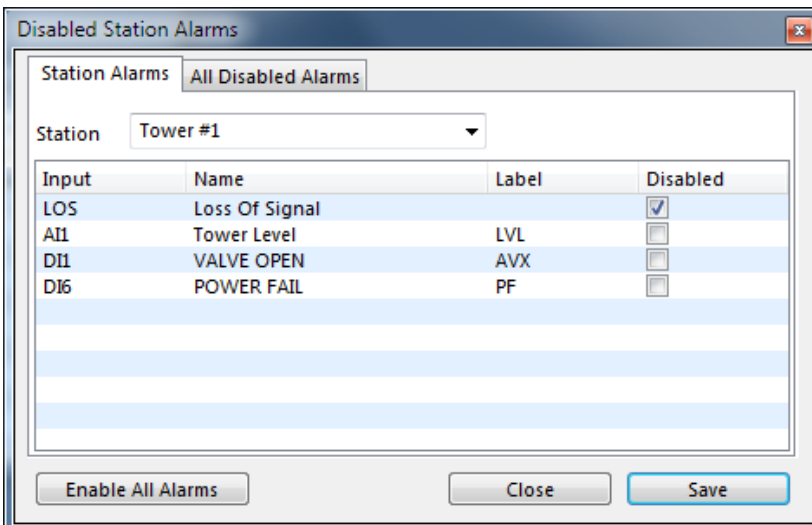
A screenshot of the 'Active Alarms' window. It features a table with four columns: 'Station Name', 'Input Name', 'Status', and 'Time Occurred'. The first three rows contain data: 'Tower #1' with 'Tower Level' at 'High' status on '03-18-2013 07:00:06am', 'Pump Station #1' with 'Discharge Pressure' at 'High' status on '03-18-2013 06:59:38am', and 'Pump Station #1' with 'Suction Pressure' at 'Low' status on '03-18-2013 06:59:55am'. The remaining rows are empty and have a light pink background.

Station Name	Input Name	Status	Time Occurred
Tower #1	Tower Level	High	03-18-2013 07:00:06am
Pump Station #1	Discharge Pressure	High	03-18-2013 06:59:38am
Pump Station #1	Suction Pressure	Low	03-18-2013 06:59:55am

Selecting “Active Alarms” from the “View” menu shows the Active Alarms list. This window will show all the current alarms. Alarms that have not been acknowledged will be shown in red. Alarms that have cleared but still have not been acknowledged will be light brown. The list can be re-sized and scrolled through with the mouse.

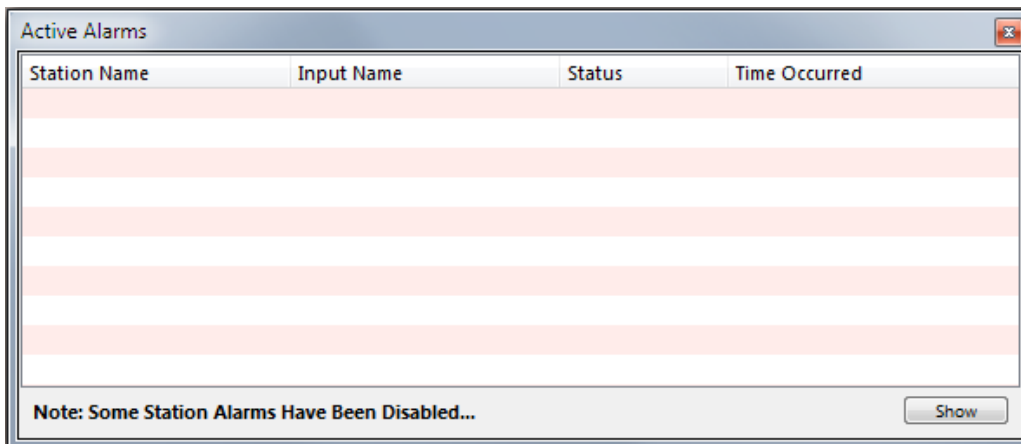
Double clicking on an alarm line will bring up the Station Display for that alarm.

Right-clicking will allow acknowledgement of individual alarms as well as selecting stations/inputs whose alarms are to be disabled:

A screenshot of the 'Disabled Station Alarms' window. It has a tabbed interface with 'Station Alarms' and 'All Disabled Alarms'. The 'Station' dropdown is set to 'Tower #1'. Below is a table with columns: 'Input', 'Name', 'Label', and 'Disabled'. The first row shows 'LOS' (Loss Of Signal) with 'LVL' label and a checked 'Disabled' checkbox. The next two rows show 'AI1' (Tower Level) with 'LVL' label and unchecked 'Disabled' checkbox, and 'DI1' (VALVE OPEN) with 'AVX' label and unchecked 'Disabled' checkbox. The last row shows 'DI6' (POWER FAIL) with 'PF' label and unchecked 'Disabled' checkbox. At the bottom are 'Enable All Alarms', 'Close', and 'Save' buttons.


Input	Name	Label	Disabled
LOS	Loss Of Signal		<input checked="" type="checkbox"/>
AI1	Tower Level	LVL	<input type="checkbox"/>
DI1	VALVE OPEN	AVX	<input type="checkbox"/>
DI6	POWER FAIL	PF	<input type="checkbox"/>

Note: When alarms have been disabled a special message will appear at the bottom of the Active Alarms window along with a button to show the disabled alarms. The main graphic viewer window will also include a warning icon after the active alarms in it's status bar.

A screenshot of the 'Active Alarms' window. The table is empty. At the bottom, there is a message box that says 'Note: Some Station Alarms Have Been Disabled...' with a 'Show' button next to it.

Station Name	Input Name	Status	Time Occurred
--------------	------------	--------	---------------

Note: Some Station Alarms Have Been Disabled... Show

User Name: None	User Level: None	Active Alarms: 0 	Connection: OK	SCADAial: Disabled
-----------------	------------------	--	----------------	--------------------

Event Logs

Event Logs

Log

Station Name

Year

Month

Start Day

End Day

Start HR

End HR

Filter

Alarm

All Stations

2010

January

12

13

0

24

Date/Time	Station Name	Input Name	Message	User
01-13-2010 05:55:20p	Rapid Mixer's	VFD1 Analog ALM	Alarm Cleared	
01-13-2010 05:52:26p	Rapid Mixer's	VFD1 Analog ALM	Alarm Acknowledged	
01-13-2010 05:52:08p	Rapid Mixer's	VFD1 Analog ALM	Alarm	
01-13-2010 02:28:27p	GE Backpulse Pumps	Train #5 Pump #2 LOW FLOW	Alarm Cleared	
01-13-2010 02:28:24p	GE Backpulse Pumps	Train #5 Pump #1 LOW FLOW	Alarm Cleared	
01-13-2010 02:24:58p	GE Backpulse Pumps	Train #5 Pump #2 LOW FLOW	Alarm Acknowledged	
01-13-2010 02:24:58p	GE Backpulse Pumps	Train #5 Pump #1 LOW FLOW	Alarm Acknowledged	
01-13-2010 02:24:58p	GE Backpulse Pumps	No Pumps Available	Alarm Acknowledged	
01-13-2010 02:24:19p	GE Backpulse Pumps	No Pumps Available	Alarm Cleared	
01-13-2010 02:20:47p	GE Backpulse Pumps	Train #5 Pump #2 LOW FLOW	Alarm	
01-13-2010 02:20:47p	GE Backpulse Pumps	No Pumps Available	Alarm	
01-13-2010 02:20:43p	GE Backpulse Pumps	Train #5 Pump #1 LOW FLOW	Alarm	
01-13-2010 02:13:29p	Plant Influent Valve	GE CAPACITY LIMIT	Alarm Acknowledged	
01-13-2010 01:57:10p	Plant Influent Valve	GE CAPACITY LIMIT	LIMIT Cleared	
01-13-2010 01:30:49p	Plant Influent Valve	GE CAPACITY LIMIT	LIMIT	
01-13-2010 01:11:43p	Finished Water	Total CL2 LOW	Alarm Cleared	
01-13-2010 01:09:58p	Finished Water	Total CL2 LOW	Alarm Acknowledged	

Selecting “Event Logs” from the “View” menu shows the Event Logs window. The Alarm log is stored in a monthly file. By default, ALL stations from the current year, month and day are selected. These options can then be changed to show any desired period of time.

The “Filter” option will find and display only the lines containing the given text.

This report also shows the number of events for the given time period and can be printed.

The types of event logs are as follows:

Alarm - logs when alarms occur, clear and when they are acknowledged by an operator.

Setpoint - changes made by operators to any system setpoints such as HOAs, Control Group setpoints etc.

System - keeps track of startups, setup change re-loads and shutdowns etc.

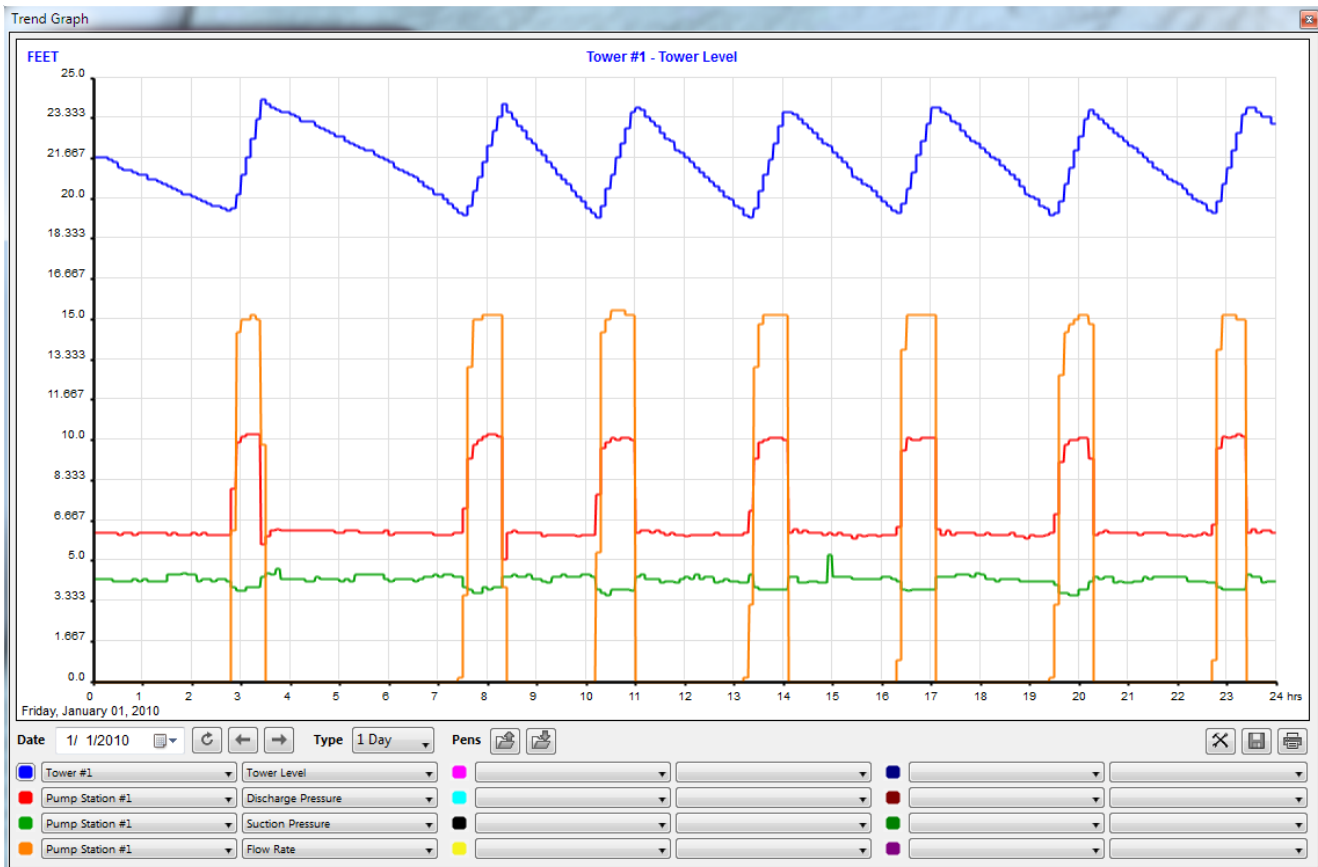
Security - log of all user security system logins/logouts.

Dialer - SCADA dial events (if this option is installed).

Reports

The following describes how to use the built-in reporting options found in SCADAview CSX. These can be selected from either the toolbar or from the “View” menu.

Trend Graph



This is a chart that will show up to 12 separate levels for a selected period of time. The user options include:

Date

Starting month, day and year for the graph. Clicking the calendar icon will bring up a calendar selector.

Left/Right Arrows

Moves date backward or forward by one day.

Type

This sets the horizontal scale for the graph. Four selections are currently available – 1 Day, 2 Day, 7 Day, 14 Day and 30 Day.

Pens

Open and save buttons allowing the pen setup to be loaded / saved.

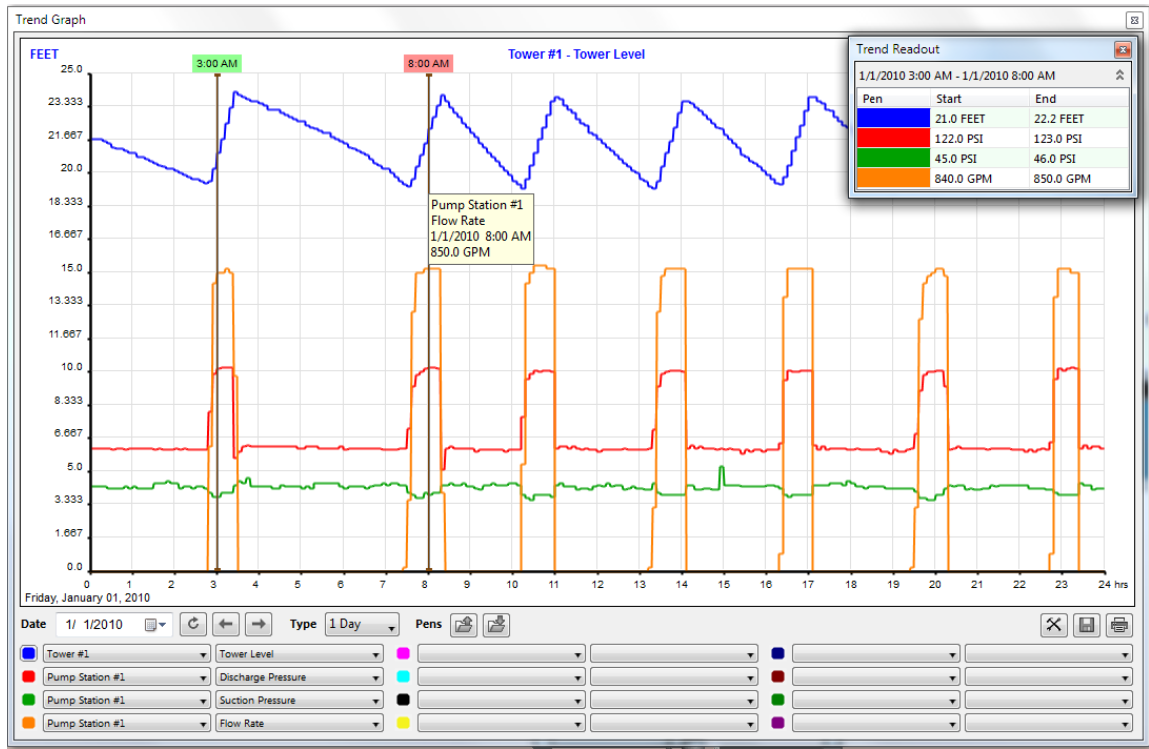
Station Names

Selected station for a particular pen color.

Input Names

Selected analog (level) or discrete input to be graphed for the corresponding pen.

Double-Clicking on the graph or Right-Clicking and selecting from the pop-up menu will allow the Data Readout to be shown or hidden. The Data Readout will display the exact analog level for each readout line along with statistics for the range between the two lines. To change the selected times, click and drag the readout lines.



- Right-Clicking on the graph will also show the following menu options:

Load Pens

Opens a .pen file containing the pen selection.

Save Pens

Saves a .pen file with the current pen selection.

Clear Pens

Clears all the current pen selections.

Hide/Show Grid

This will turn off or on the light gray grid lines.

Show/Hide Readout

Data readout window will be shown or hidden.

Area/Line Graph

Selects the graph style - area graphs will fill with the pen color to each axis.

Background Color

Selects a different background color for the graph (normally white)

Pen Size

Data pen width can be selected from 1-4 pixels.

Export Data...

This option will save a comma delimited file (.CSV)

Print...

Allows the graph to be printed.

Various options can also be set by selecting the menu item or clicking on the “Graph Options” button.

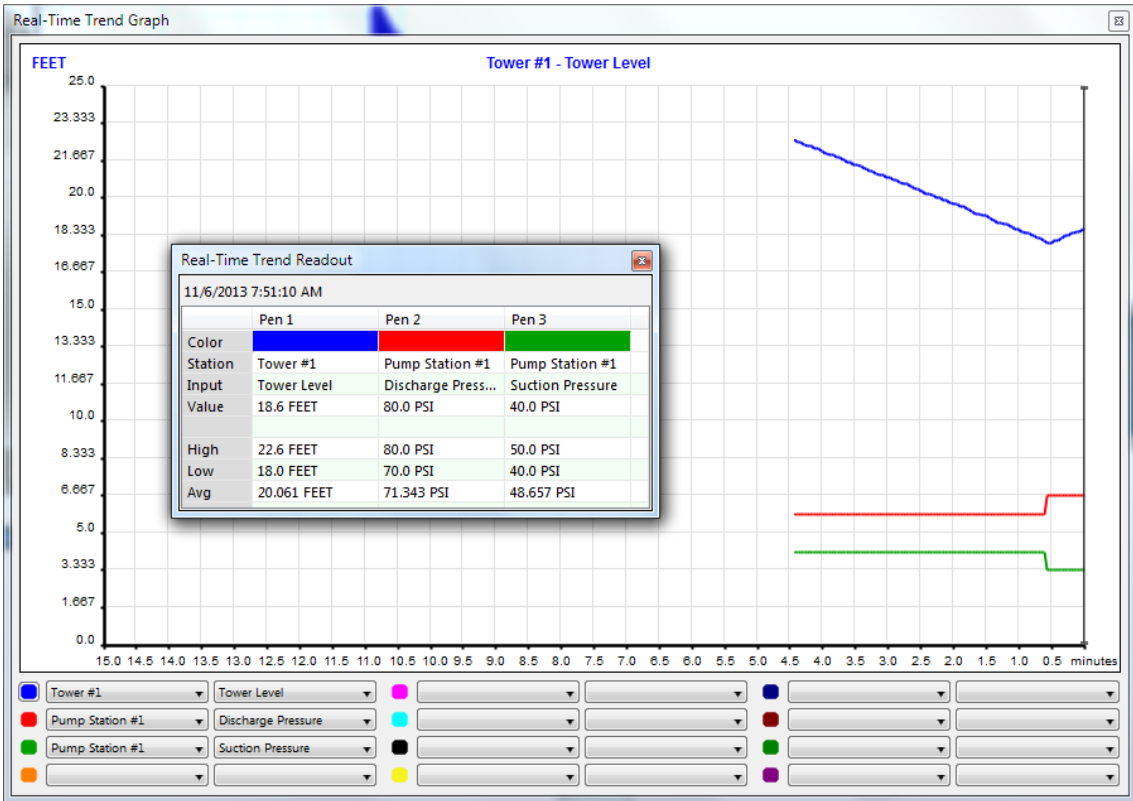
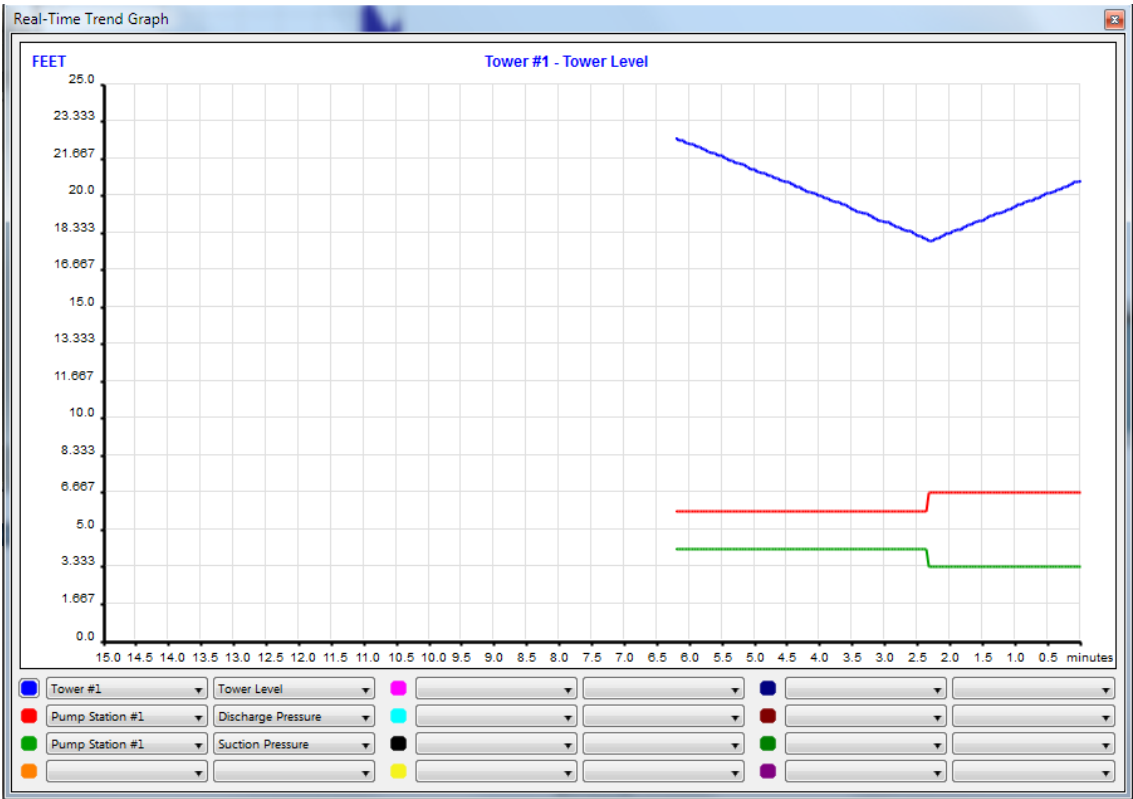
The 'Trend Graph Options' dialog box contains the following settings:

- Graph Style:** Line
- Grid Lines:** ☒
- Gray Pen LOS Data:** ☐
- Pen Size:** 2
- Readout Style:** Horizontal
- Date Selection:** Type (days)
- Export Resolution:** 1 Minutes
- Foreground Color:** Black
- Background Color:** White
- Pen Colors:** A grid of color swatches including Blue, Magenta, Dark Blue, Red, Cyan, Maroon, Green, Black, Dark Green, Orange, Yellow, and Purple.

Buttons at the bottom include 'Set Defaults' and 'Save'.

Real-Time Trend Graph

Similar to the Trend Graph, the Real-Time trend is a chart that will show up to 12 separate levels for a past number of minutes and is updated every couple of seconds. This allows for much greater detail when viewing a rapidly changing value.



Pump Runtime Report

Reports

Daily Pump Reports

Analog Report

Pump Runtime Report

Custom Daily Reports

Custom Timed Reports

Station Name

Start Date

End Date

Start HR

End HR

Pump Station #1

1/ 1/2010

1/31/2010

12 am

12 am

×

SCADAview CSX Demo System

Pump Station #1 - Pump Runtime Report for January 1, 2010 12:00am to January 31, 2010 11:59pm

#	Discrete Input Label	Hours	Cycles	#	Discrete Input Label	Hours	Cycles
1	Pump #1	85.1	104	9		0.0	0
2	Pump #2	78.4	108	10		0.0	0
3	High Discharge	0.0	0	11		0.0	0
4	Bypass Valve	0.0	0	12		0.0	0
5	Low Suction	0.9	5	13		0.0	0
6	Power Fail	0.0	0	14		0.0	0
7	Entry Alarm	0.0	0	15		0.0	0
8	Station Flood	0.0	0	16		0.0	0

Flow Summary

#	Flow Total Input Label	Total Flow	Flow Rate High	Flow Rate Low	Flow Rate NZAvg
1	Flow Total	7,436,000 GAL	1,310.0 GPM	0.0 GPM	733.26 GPM

Expansion Inputs

#	Expansion Input Label	Hours	Cycles	#	Expansion Input Label	Hours	Cycles
1	PUMP 1 HAND	0.0	0	17		0.0	0
2	PUMP 1 AUTO	0.0	0	18		0.0	0
3	PUMP 2 HAND	0.0	0	19		0.0	0
4	PUMP 2 AUTO	0.0	0	20		0.0	0
5	PUMP 3 HAND	0.0	0	21		0.0	0
6	PUMP 3 AUTO	0.0	0	22		0.0	0
7	DOOR OPEN	0.0	0	23		0.0	0
8	OPER PRESENT	0.0	0	24		0.0	0
9		0.0	0	25		0.0	0
10		0.0	0	26		0.0	0
11		0.0	0	27		0.0	0

This report will compute and display runtimes for discrete inputs DI1-DI16 and expansion inputs EI1-EI32. In addition to pump runtimes, it will also show the minimum, maximum and average flow rate and the total flow for a selected period of time. The user simply selects the station name, start date, end date, start hour and end hour. All runtimes are shown in hours and tenths of hours. This report is based on the 1-minute historical files.

Analog Report

Reports

Daily Pump Reports

Analog Report

Pump Runtime Report

Custom Daily Reports

Custom Timed Reports

Station Name

Pump Station #1

Start Date

1/ 1/2010

End Date

1/31/2010

Start HR

12 am

End HR

12 am

SCADAview CSX Demo System

Pump Station #1 - Analog Report for January 1, 2010 12:00am to January 31, 2010 11:59pm

#	Analog Input Label	Units	High	Low	Average	NZAvg	Difference
1	Discharge Pressure	PSI	125.0	0.0	81.149	82.196	125.0
2	Suction Pressure	PSI	63.0	30.0	49.496	49.496	33.0
3			0.0	0.0	0.0	0.0	0.0
4			0.0	0.0	0.0	0.0	0.0
5			0.0	0.0	0.0	0.0	0.0
6	Temperature	DEG	-78.5	-78.5	-78.5	0.0	0.0
7		LV7	0.0	0.0	0.0	0.0	0.0
8		LV8	0.0	0.0	0.0	0.0	0.0

Report Generated: Monday, March 18, 2013 6:14:58 AM

This report will compute and display the minimum, maximum, average, non-zero average and difference all analog inputs in a station for a selected period of time. The user selects the station name, start date, end date, starting and ending hour. This report is based on the 1-minute historical files.

Daily Pump Reports

Reports

Daily Pump Reports

Analog Report

Pump Runtime Report

Custom Daily Reports

Custom Timed Reports

Station Name

Pump Station #1

Start Date

1/ 1/2010

End Date

1/31/2010

SCADAview CSX Demo System

Pump Station #1 - Daily Pump Report for January 1, 2010 to January 31, 2010

	Runtime (hours)								Flow Total	Flow Rate High	Flow Rate Low	Flow Rate NZAvg
Date	#1	#2	#3	#4	#5	#6	#7	#8	GAL	GPM	GPM	GPM
01-01-2010	4.00	4.90	0.00	0.00	0.00	0.00	0.00	0.00	201,000	440.0	0.0	353.05
01-02-2010	4.40	4.10	0.00	0.00	0.00	0.00	0.00	0.00	198,000	440.0	0.0	351.52
01-03-2010	5.00	4.70	0.00	0.00	0.00	0.00	0.00	0.00	212,000	440.0	0.0	324.53
01-04-2010	3.90	6.00	0.00	0.00	0.00	0.00	0.00	0.00	206,000	440.0	0.0	313.89
01-05-2010	6.10	3.20	0.00	0.00	0.00	0.00	0.00	0.00	210,000	440.0	0.0	343.76
01-06-2010	6.10	5.70	0.00	0.00	0.00	0.00	0.00	0.00	263,000	440.0	0.0	343.31
01-07-2010	5.40	3.60	0.00	0.00	0.00	0.00	0.00	0.00	194,000	440.0	0.0	343.58
01-08-2010	4.10	5.00	0.00	0.00	0.00	0.00	0.00	0.00	201,000	440.0	0.0	336.4
01-09-2010	6.30	4.40	0.00	0.00	0.00	0.00	0.00	0.00	248,000	440.0	0.0	304.38
01-10-2010	2.90	6.00	0.00	0.00	0.00	0.00	0.00	0.00	204,000	440.0	0.0	330.0
01-11-2010	2.80	6.00	0.00	0.00	0.00	0.00	0.00	0.00	203,000	440.0	0.0	369.89
01-12-2010	6.90	4.50	0.00	0.00	0.00	0.00	0.00	0.00	259,000	440.0	0.0	359.5
01-13-2010	5.90	3.00	0.00	0.00	0.00	0.00	0.00	0.00	179,000	440.0	0.0	290.8
01-14-2010	4.20	5.40	0.00	0.00	0.00	0.00	0.00	0.00	219,000	440.0	0.0	367.68
01-15-2010	4.00	6.80	0.00	0.00	0.00	0.00	0.00	0.00	231,000	440.0	0.0	358.04
01-16-2010	5.80	3.20	0.00	0.00	0.00	0.00	0.00	0.00	213,000	440.0	0.0	363.54
01-17-2010	5.80	4.80	0.00	0.00	0.00	0.00	0.00	0.00	236,000	440.0	0.0	364.11
01-18-2010	3.80	5.50	0.00	0.00	0.00	0.00	0.00	0.00	210,000	440.0	0.0	344.27
01-19-2010	4.90	3.40	0.00	0.00	0.00	0.00	0.00	0.00	186,000	440.0	0.0	374.35
01-20-2010	7.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	239,000	440.0	0.0	352.63
01-21-2010	5.70	2.80	0.00	0.00	0.00	0.00	0.00	0.00	188,000	440.0	0.0	364.42
01-22-2010	6.90	3.90	0.00	0.00	0.00	0.00	0.00	0.00	244,000	440.0	0.0	350.88
01-23-2010	6.10	2.50	0.00	0.00	0.00	0.00	0.00	0.00	202,000	440.0	0.0	351.37
01-24-2010	5.40	6.20	0.00	0.00	0.00	0.00	0.00	0.00	255,000	440.0	0.0	360.67
01-25-2010	4.70	3.20	0.00	0.00	0.00	0.00	0.00	0.00	178,000	440.0	0.0	350.82

This report uses a file that is updated every midnight and stores daily totals for Pump Runtimes, minimum Flow Rate, maximum Flow Rate, non-zero average Flow Rate and Flow Total. The report window will display the lines from this file based on the time period selected along with grand total numbers for each item at the bottom.

Custom Daily Reports

Reports

Daily Pump ReportsAnalog ReportPump Runtime ReportCustom Daily ReportsCustom Timed Reports

Report NameStart DateEnd Date

Custom Daily Report1/ 1/20101/31/2010

Custom Daily Report for January 1, 2010 to January 31, 2010

	Pump Station #1	Pump Station #1	Pump Station #1	High Service Pumps	High Service Pumps
	Pump #1 Run	Pump #2 Run	24hr Flow Total	Pump 1 Run	Pump 2 Run
Date	Hours	Hours	Gallons	Hours	Hours
01-01-2010	24.00	18.00	450	24.00	23.50
01-02-2010	24.00	18.00	300	24.00	23.50
01-03-2010	24.00	16.40	300	13.10	21.00
01-04-2010	6.40	23.10	300	11.00	23.50
01-05-2010	24.00	18.00	300	13.10	23.50
01-06-2010	24.00	16.40	300	13.10	23.50
01-07-2010	6.40	23.10	300	12.00	15.00
01-08-2010	24.00	18.00	300	13.10	23.50
01-09-2010	24.00	16.40	300	13.10	23.50
01-10-2010	6.40	23.10	300	13.10	23.50
01-11-2010	24.00	18.00	300	17.00	20.00
01-12-2010	24.00	16.40	300	13.10	23.50
01-13-2010	6.40	23.10	300	13.10	23.50
01-14-2010	6.40	23.10	300	13.10	16.00
01-15-2010	6.40	23.10	300	14.00	23.50
01-16-2010	6.40	23.10	300	13.10	23.50
01-17-2010	24.00	18.00	300	13.10	23.50
01-18-2010	24.00	16.40	300	13.10	19.00
01-19-2010	6.40	23.10	300	13.10	23.50
01-20-2010	24.00	18.00	300	13.10	23.50
01-21-2010	24.00	16.40	300	13.10	23.50
01-22-2010	6.40	23.10	300	10.00	23.50
01-23-2010	24.00	18.00	300	13.10	23.50
01-24-2010	24.00	16.40	300	13.10	23.50
01-25-2010	6.40	23.10	300	14.00	18.00
01-26-2010	24.00	18.00	300	13.10	23.50

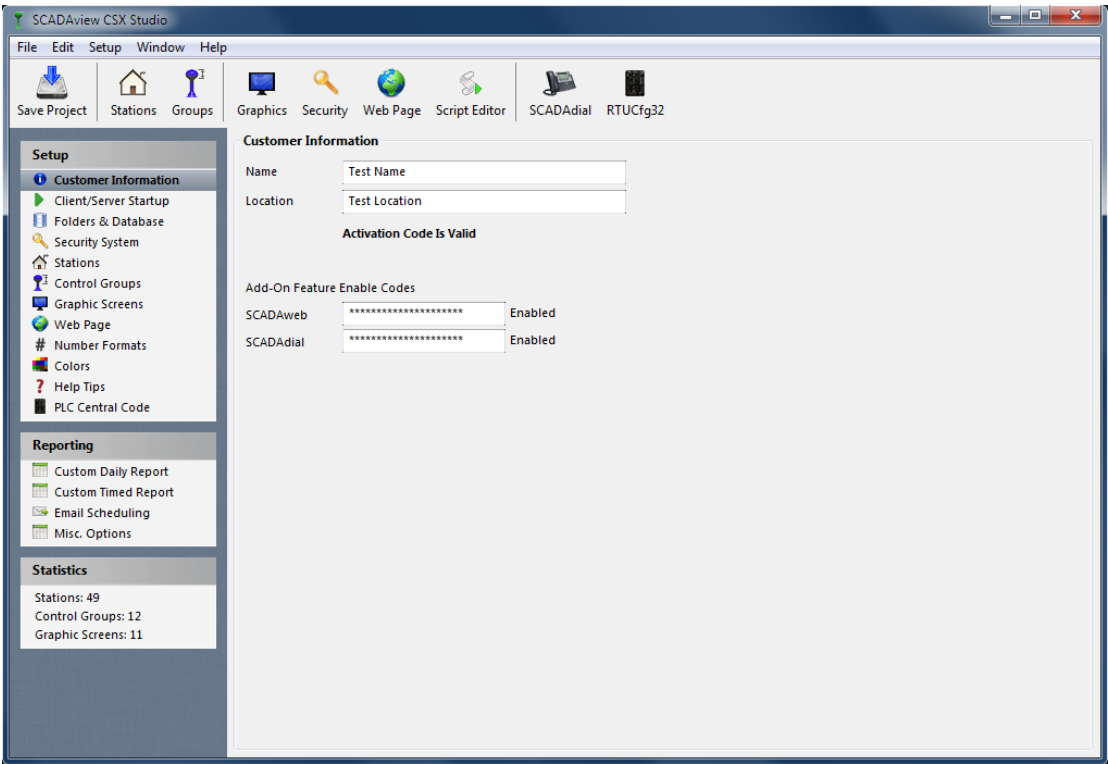
This report uses a file that is updated every midnight and stores custom daily numbers for Pump Runtimes, minimum Flow Rate, maximum Flow Rate, non-zero average Flow Rate and Flow Total etc. The report window will display the lines from this file based on the time period selected along with grand total numbers for each item at the bottom.

Custom Timed Reports

Reports									
<div> Daily Pump Reports Analog Report Pump Runtime Report Custom Daily Reports Custom Timed Reports </div>									
Report Name: Custom Timed Report Start Date: 11/ 1/2014 End Date: 11/ 1/2014									
Micro-Comm Demo System Custom Timed Report for November 1, 2014 to November 1, 2014									
	Tower #1	Pump Station #1	Pump Station #1	Pump Station #1	Pump Station #1	Pump Station #1	Pump Station #1	Prev Total PSI	Total Pressure
	Tower Level	Discharge Pressure	Suction Pressure	Flow Rate	Flow Rate #2	Flow Rate #3			
Date	ft	PSI	PSI	GPM	GPM	GPM	PSI	PSI	
11-01-2014 00:00:00	70.6	45.3	29.3	293.0	2,098.0	2,252.0	65.6	74.6	
11-01-2014 00:15:00	79.6	49.8	33.8	338.0	2,098.0	2,256.0	74.6	83.6	
11-01-2014 00:30:00	88.6	54.3	38.3	383.0	2,088.0	2,238.0	83.6	92.6	
11-01-2014 00:45:00	82.4	51.2	35.2	352.0	2,099.0	2,249.0	92.6	86.4	
11-01-2014 01:00:00	73.4	46.7	30.7	307.0	2,096.0	2,250.0	86.4	77.4	
11-01-2014 01:15:00	64.4	42.2	26.2	262.0	2,094.0	2,249.0	77.4	68.4	
11-01-2014 01:30:00	64.3	42.1	26.1	261.0	2,094.0	2,244.0	68.4	68.2	
11-01-2014 01:45:00	73.2	46.6	30.6	306.0	2,095.0	2,245.0	68.2	77.2	
11-01-2014 02:00:00	82.2	51.1	35.1	351.0	2,106.0	2,255.0	77.2	86.2	
11-01-2014 02:15:00	88.7	54.3	38.3	383.0	2,096.0	2,251.0	86.2	92.6	
11-01-2014 02:30:00	79.8	49.8	33.8	338.0	2,093.0	2,248.0	92.6	83.6	
11-01-2014 02:45:00	70.8	45.3	29.3	293.0	2,096.0	2,252.0	83.6	74.6	
11-01-2014 03:00:00	61.8	40.8	24.8	248.0	2,101.0	2,251.0	74.6	65.6	
11-01-2014 03:15:00	67.0	43.5	27.5	275.0	2,095.0	2,249.0	65.6	71.0	
11-01-2014 03:30:00	76.0	48.0	32.0	320.0	2,087.0	2,242.0	71.0	80.0	
11-01-2014 03:45:00	85.0	52.5	36.5	365.0	2,095.0	2,240.0	80.0	89.0	
11-01-2014 04:00:00	86.0	52.9	36.9	369.0	2,096.0	2,241.0	89.0	89.8	
11-01-2014 04:15:00	77.0	48.4	32.4	324.0	2,105.0	2,254.0	89.8	80.8	
11-01-2014 04:30:00	68.0	44.0	28.0	280.0	2,092.0	2,241.0	80.8	72.0	
11-01-2014 04:45:00	60.7	40.4	24.4	244.0	2,100.0	2,249.0	72.0	64.8	
11-01-2014 05:00:00	69.7	44.9	28.9	289.0	2,103.0	2,253.0	64.8	73.8	
11-01-2014 05:15:00	78.7	49.4	33.4	334.0	2,100.0	2,250.0	73.8	82.8	
11-01-2014 05:30:00	87.7	53.9	37.9	379.0	2,098.0	2,247.0	82.8	91.8	
11-01-2014 05:45:00	83.3	51.6	35.6	356.0	2,098.0	2,253.0	91.8	87.2	
11-01-2014 06:00:00	74.3	47.1	31.1	311.0	2,091.0	2,246.0	87.2	78.2	
11-01-2014 06:15:00	65.3	42.6	26.6	266.0	2,092.0	2,242.0	78.2	69.2	
11-01-2014 06:30:00	63.5	41.8	25.8	258.0	2,098.0	2,243.0	69.2	67.6	
11-01-2014 06:45:00	72.5	46.3	30.3	303.0	2,098.0	2,242.0	67.6	76.6	
11-01-2014 07:00:00	81.5	50.8	34.8	348.0	2,094.0	2,246.0	76.6	85.6	
11-01-2014 07:15:00	89.5	54.7	38.7	387.0	2,089.0	2,241.0	85.6	93.4	

This report uses a file that is updated on a user-selected time interval (1 minute, 15 minute etc.) and saves snapshot values for any station's data. The report window will display the lines from this file based on the period selected. High, low and average values will be computed and shown at the bottom of the report.

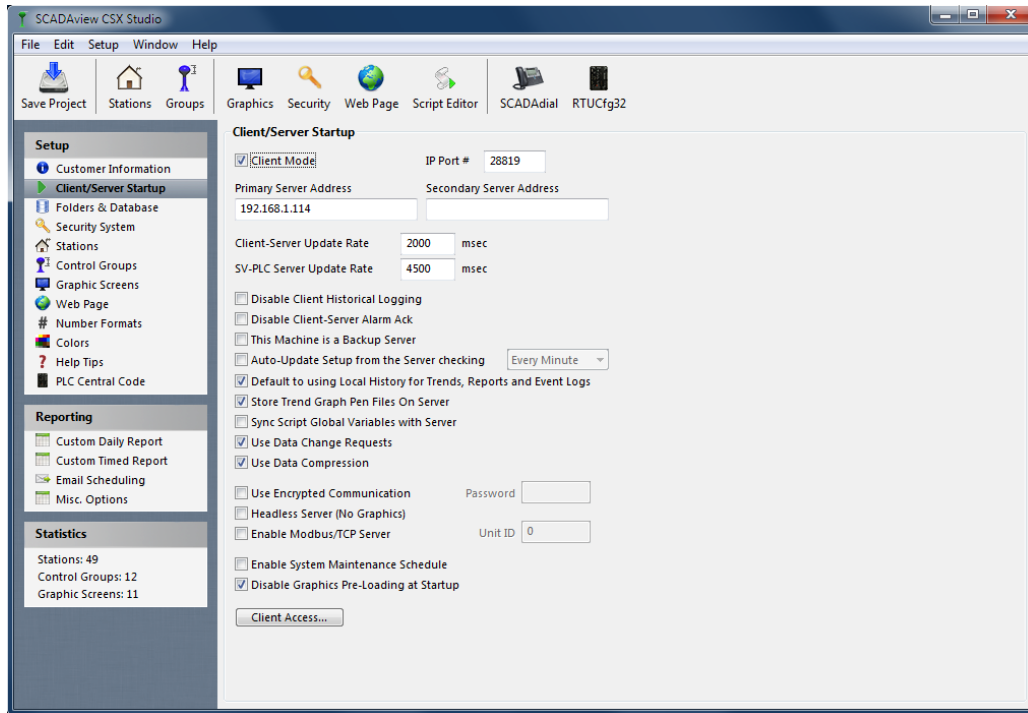
SCADAview CSX Studio



Customer Information

Use this setup screen in SCADAview CSX Studio to put in the customer’s name and location. These are used when activating the program over the internet and are also used on the Web page and in some reports. The Add-On features such as the web page are also enabled using this screen - paste in the codes and click the “Save Project” toolbar button.

Client/Server Startup Options



Client Mode

Makes SCADAview connect to a remote machine (SCADAview CSX Server) at startup and act as a client.

Data Update Rate (msec)

This is how often a SCADAview CSX client will request information from the server. This should be set higher when using a slow network radio connection or the Internet.

Primary Server IP Address

The IP address or hostname of the SCADAview CSX Server machine.

Secondary Server IP Address

The IP address or hostname of another SCADAview CSX Server that will be used if the primary fails.

IP Port

The IP port number to be used for client-server communication as well as SCADAview NET protocol connections.

Disable Client Historical Logging

Clients will not save any history files when this is checked.

Disable Client-Server Alarm Ack

Clients will not pass the alarm acknowledgements to the server when this is checked. The server machine will need to be acknowledged locally.

This Machine is a Backup Server

When checked, this machine will become a backup server if necessary. The SV-PLC data server will be launched in order to become a SCADAview CSX Server in case the primary and secondary servers fail. The primary server will then be tested periodically and this machine will become a client again when the primary server is back on-line.

Auto-Update Setup File from the Server

Whenever a change is made to the setup on the server, this option trigger the client to re-download all the current setup.

Default to using Local History for Trends, Reports and Event Logs

Forces a SCADAview CSX Client machine to use local data instead of requesting data from the server.

Store Trend Graph Pen Files On Server

If checked the save and open dialog boxes will be replaced with a selector that will save or load pen files on the server. Pen files are also saved locally.

Sync Script Global Variables with Server

When checked, CSX Script variables will be passed from server to client and sent back to the server when changed on a client. Normally this is not done and all variables will be local to the SCADAview CSX.

Use Data Change Requests

When checked, CSX clients will use special data requests for only the station or group data that has changed since the last request. This can be useful when the TCP connection is slow and the data is not really changing very rapidly on the server - which is typical for radio telemetry systems.

Use Data Compression

When checked, CSX clients will use data requests that will result in compressed data replies. This can be useful when the client-server connection is slow.

Use Encrypted Communication

Client/Server communication and SCADAview NET protocol connections can use encryption. If used, the same password must be entered at each client and server.

Headless Server Mode - Graphics Disabled

Checking this will make a dedicated server use the least amount of system resources by disabling all local graphics rendering.

Enable Modbus/TCP Server

This makes SCADAview act as a Modbus/TCP server with each station's data (normal station data order) located at 4x100, 4x200 etc. for each station in the list. You must also enter the correct Modbus/TCP Unit ID (default is normally 0).

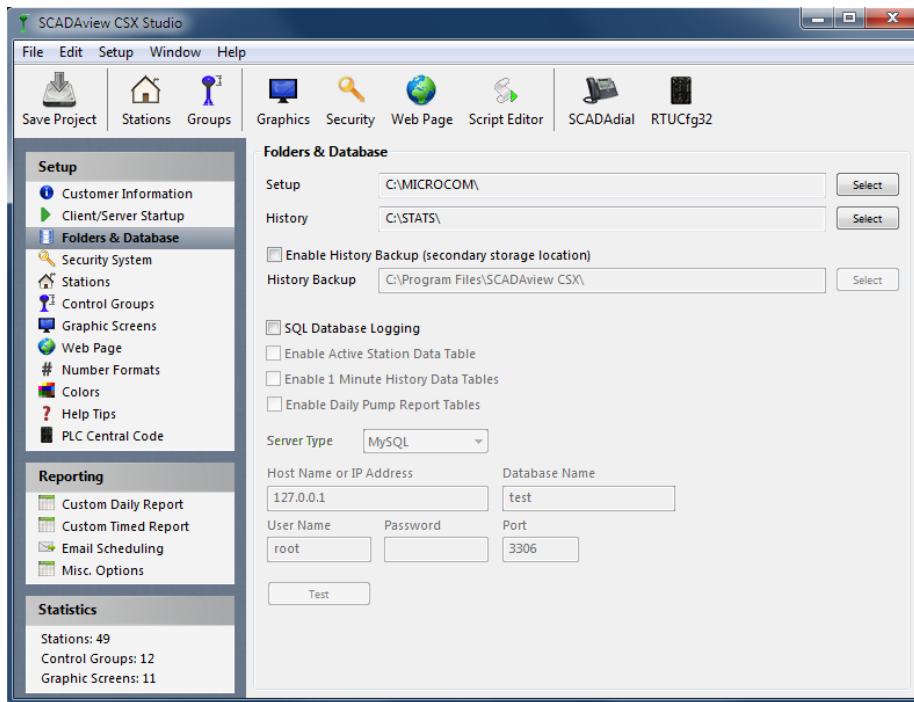
Enable System Maintenance Schedule

If checked the server will be re-started every 5 days in order to clear memory and perform other maintenance tasks. This will occur at 2:08 AM on the 1st, 6th, etc. day of the month.

Disable Graphics Pre-Loading at Startup

If checked the graphics screens will be loaded as needed instead of all during startup. This speeds up initial startup and reduces memory usage.

Folders & Database



Setup and History Folders

This shows the current paths to where all the project files and history is stored on the computer. Click the “Select” buttons to change the locations.

Backup History (secondary storage location)

This shows the path to where all history will be logged in addition to the primary location. This could be a network location or external drive.

SQL Database Logging

If an SQL database server is available, click this checkbox to enable historical information logging to various tables in the database.

Enable Active Station Data Table

If this is checked an extra table is created and updated every minute with all current station data. The SCADAreport add-on may need this for snapshot data.

Enable 1 Minute History Data Tables

If this is checked all 1 minute history will also be logged to the SQL server. Separate tables for each station will be created. The SCADAreport add-on may also need this data to generate reports.

Enable Daily Pump Report Tables

If this is checked all station daily pump reports will be logged to the SQL server. Separate tables for each station will be created.

Server Type

The type of SQL server being used. Currently the choices are MySQL, MS SQL, PostgreSQL, Oracle and ODBC.

Host Name or IP Address

This could be “localhost” if the SQL server is running on the local machine or may be a remote IP address.

Database Name

This will need to be a valid database name that already exists on the server.

User Name and Password

A valid login will be necessary to the SQL server. This will need to be set ahead of time.

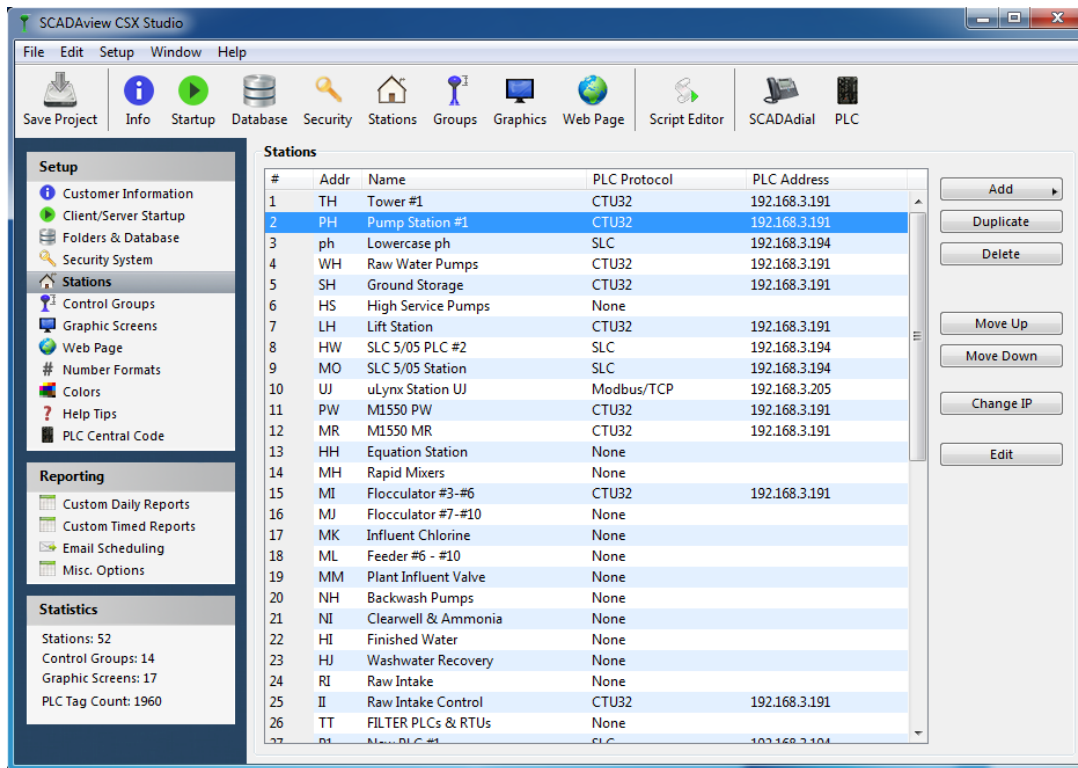
Port

This will selected automatically based on the server but can also be changed to special ports if necessary.

Test

Use this button to open a test connection to the selected server and database.

Station Setup



Database Controls

Stations

Use this list to select the station to edit - double click or select and click the edit button. This list will show the name, address, PLC protocol and IP address / COM settings for each station.

Add

Click this button to add a new station to the end of the database.

Duplicate

Adds a new station with it's setup the same as the selected station.

Delete

Deletes the selected station or stations.

Move Up/Down

Changes the order in which the stations appear in SCADAview CSX menu lists and system displays.

Change IP

Will allow changes to multiple selected station's IP address and protocol selection.

Save Project

Use this toolbar button to save any changes made.

General

The screenshot shows a software window titled "Station - Pump Station #1". It has a tabbed interface with tabs for General, PLC, Analog Ins, Discretes, HOAs, Expansion, Flow, Analog Outs, Setpoints, and Accumulators. The "General" tab is active. Inside the tab, there are several configuration sections: "Address" with a dropdown set to "PH"; "Name" with a text field containing "Pump Station #1"; "Data Source" with a dropdown set to "SV-PLC Server"; four unchecked checkboxes for "Local Expanded Data", "Remote Flow Rate and Total", "Remote PC HOAs (polled on-demand)", and "Enable Radio Diagnostics Polling"; a "Data Expression" text field; and a "Data Change Script" dropdown set to "None" with an "Edit Script" button. At the bottom right is a help icon (?). At the bottom center are "Close" and "Save" buttons.

Address

The two letter code (HH-WW) assigned by Micro-Comm for the station when setting up a new system.

Name

Enter a name for this station. This name will be displayed on all screens and reports dealing with this station.

Data Source

The data for the station will be acquired from the selected source which can be either "SV-PLC Server" or "None / Data Entry". SV-PLC communicates with various PLC types. The "None / Data Entry" selection can be used for special purposes such as data consolidation or manually entered lab data that needs to be logged (analog input values can be entered).

Local Expanded Data

This is used for stations located in the PLC that have been set up to support expanded data. Additional analog inputs, outputs and flow information can then be gathered for this station.

Remote Flow Rate and Total

When using distributed control the station's flow information will be polled for and the flow total will be remotely changeable.

Remote PC HOAs

When this is checked and used with CTU32 protocol RTUs, the Hand/Off/Auto controls will be out at the remote and are accessed on-demand (read/send buttons added to the HOA screens).

Enable Radio Diagnostics Polling

This allows CSX script to access the latest radio diagnostic counters for use in graphical diagnostic screens or alarm generation.

Data Expression

Expressions may be used that will take station data values and place results in other station data locations. See "Data Expressions" section later in this manual for more information.

Data Change Script

If selected, the CSX script will be run any time data changes for this station. Use the "Edit Script" button to make changes to this script or create a new one.

Analog Ins

Name	Units	Range	Preset	Label	Trend Min	Trend Max
AI1 Discharge Pressure	PSI	0.1	0	DP	0	300
AI2 Suction Pressure	PSI	0.1	0	SP	0	300
AI3		1	0	P1	0	500
AI4		1	0	T1	0	65536
AI5		1	0		0	60
AI6 Temperature	DEG	1	-50	TMP	0	241
AI7	LV7	1	0	A7	0	65
AI8	LV8	1	0	A8	0	100

☐ Send High/Low Setpoints to PLC Reference

Close Save

Name

This is the label used on all reports and displays to name each analog input. This is also the message printed when the analog is in an alarm state.

Units

Enter the unit of measure for this analog (FEET, PSI, GPM etc.)

Range

For analog inputs, the range is the multiplier that is used on the raw value from the PLC.

Example: If the PLC analog value of 0-4095 is to be displayed as 240 ft, the range would be 0.0586 (4095 x Range = Full Scale of Measured/Displayed Value).

Preset

This pre-sets or offsets the starting raw value for an analog input. This allow scales that don't begin at zero.

Displayed values are computed: (raw + preset) x range

Label

Enter an abbreviation for this analog (LVL, DP, SP etc.)

Trend Min/Max

Trend graphs will use this for the Y-Axis scale (which can also be changed on the graph).

Send High/Low Setpoints to PLC

If checked, SCADAview CSX will send a block of up to 32 words to the PLC with High/Low setpoint pairs starting at the "Reference" entered. The base reference will depend on the PLC protocol used (CTU32 would be just the uloc such as 1000, SLC protocol may be something like N20:0).

Flow

Name	Units	Range	Preset	Label	Trend Min	Trend Max
FR1 Flow Rate	GPM	1	0	FR	0	1400
FT1 Flow Total	GAL	1000		FT		

Flow Rate and Flow Total

Name

This is the label used on all reports and displays to label the flow rate or total input.

Units

Enter the unit of measure for this rate or total (GPM, GALLONS)

Range

For flow rate enter the raw value multiplier (raw x range = full scale flow rate).

For flow total enter the increment value for the totalizer. (Usually either 100 or 1000 gallon increments).

Preset

This pre-sets or offsets the starting raw value for an analog input. This allow scales that don't begin at zero. Displayed values are computed: (raw + preset) x range

Label

Enter an abbreviation for this rate or total (FR, FT)

Trend Min/Max

Trend graphs will use this for the flow rate Y-Axis scale (which can also be changed on the graph).

Discretes

Station - Pump Station #1

General PLC Analog Ins **Discretes** HOAs Expansion Flow Analog Outs Setpoints Accumulators

Discrete Inputs

	Name	On Msg	Off Msg	Mode	Label	CG
DI1	Pump #1	RUN	OFF	CRFHOA	P1X	1
DI2	Pump #2	RUN	OFF	CRFHOA	P2X	1
DI3						
DI4	Bypass Valve			CRF	V1X	
DI5	Low Suction	ALARM		A1	LSP	
DI6	Power Failure		ALARM	A1	PF	
DI7						
DI8						
DI9						
DI10						
DI11						
DI12						
DI13						
DI14						
DI15						
DI16						

Close Save

Name

The name for the discrete input. This name is displayed on the station display and will also be used for graphics tagging.

On Msg

Enter the label to be shown when the device is on or alarming.

Off Msg

Enter the label to be shown when the device is off.

Mode

Use the item list to select the available operating modes for the discrete input in question. Valid operating modes are:

A1 - Alarm when input is on, A0 - Alarm when input is off

S1 - Status when input is on, S0 - Status when input is off

CRF - Call/Run/Fail

CRFHOA - Call/Run/Fail/Hand/Off/Auto (remote HOA monitoring using expansion inputs)

Label

This is the label shown on the System Display screen for this discrete input or controlled device and is also used for graphics tagging. For controlled devices enter an abbreviation ending in X.

Example: P1X - the last character will change to display the current status of the device (R=Run, C=Call, F=Fail, O=Off).

CG

The control group # associated with the pump input. This is mainly for linking control groups with the Pump Control Panel window.

Expansion

Station - Pump Station #1

General PLC Analog Ins Discretes HOAs **Expansion** Flow Analog Outs Setpoints Accumulators

Expansion Inputs

	Name	On Msg	Off Msg	Mode	Label
E11	PUMP 1 HAND			S1	P1H
E12	PUMP 1 AUTO			S1	P1A
E13	PUMP 2 HAND			S1	P2H
E14	PUMP 2 AUTO			S1	P2A
E15	PUMP 3 HAND			S1	P3H
E16	PUMP 3 AUTO			S1	P3A
E17	DOOR OPEN			S1	DO
E18	OPER PRESENT			S1	OP
E19					
E110					
E111					
E112					
E113					
E114					
E115					
E116					
E117					

Close Save

Name

The name of the expansion discrete input. This name is displayed on the station display and will also be used for graphics tagging.

On Msg

Enter the label to be shown when the device is on or alarming.

Off Msg

Enter the label to be shown when the device is off.

Mode

Use the item list to select the available operating modes for the expansion input. Valid operating modes are:

A1 - Alarm when input is on, A0 - Alarm when input is off

S1 - Status when input is on, S0 - Status when input is off

P1 - Pump status RUN or OFF (adds an R or O to the label)

Label

This is the label shown on the System Display screen for this input and is also used for graphics tagging.

Remote Setpoints

Station - Pump Station #1

General | PLC | Analog Ins | Discretes | HOAs | Expansion | Flow | Analog Outs | **Setpoints** | Accumulators

Remote Stop Labels				Remote Start Labels					
	Stop Label	Units	Range	Preset		Start Label	Units	Range	Preset
1	Lead Backup Stop	FT	0	0	1	Lead Backup Start	0	1	0
2	Lag Backup Stop	FT	0	0	2	Lag Backup Start	0	1	0
3			0	0	3			0	0
4			0	0	4		0	0	0
5			0	0	5		0	0	0
6			0	0	6			0	0
7			0	0	7		0	0	0
8			0	0	8		0	0	0
9			0	0	9			0	0
10			0	0	10		0	0	0
11			0	0	11		0	0	0
12			0	0	12			0	0

Close Save

Remote setpoints are read and sent to remote stations on-demand. They could be used at the remote to control outputs when in backup control or for any other purpose. These setpoints represent the variables STOP1, START1 through STOP12, START12 in a Micro-Comm RTU.

Stop Label

Label used to describe the stop setpoint. i.e. "Pump 1 Stop"

Start Label

Label used to describe the start setpoint. i.e. "Pump 1 Start"

Units

Enter the unit of measure for this setpoint (FEET, PSI, GPM etc.)

Range

The range is the multiplier that is used on the raw value from the PLC.

Example: If the PLC analog value of 0-4095 is to be displayed as 240 ft, the range would be 0.0586 (4095 x Range = Full Scale of Measured/Displayed Value).

Preset

This pre-sets or offsets the starting raw value. This allow scales that don't begin at zero.

Displayed values are computed as follows: (raw + preset) x range

HOAs

Station - Pump Station #1

GeneralPLCAnalog InsDiscretesHOAsExpansionFlowAnalog OutsSetpointsAccumulators

Hand/Off/Auto Controls

Name	Selector Type
DO1 Pump #1	Hand/Off/Auto
DO2 Pump #2	Hand/Off/Auto
DO3 Pump #3	Hand/Off/Auto
DO4 Bypass Valve	Open/Close/Auto
DO5	Hand/Off/Auto
DO6	Hand/Off/Auto
DO7	Hand/Off/Auto
DO8	Hand/Off/Auto

Virtual Hand/Off/Auto Controls

Name	Selector Type
X9	Hand/Off/Auto
X10	Hand/Off/Auto
X11	Hand/Off/Auto
X12	Hand/Off/Auto
X13	Hand/Off/Auto
X14	Hand/Off/Auto
X15	Hand/Off/Auto
X16	Hand/Off/Auto

CloseSave

These HOA labels are used whenever an output needs to be labeled differently from the corresponding input. If labels are left blank, the discrete input labels will be used instead.

The HOAs have a “Selector Type” for what options will be displayed in a drop-down list or on a graphical HOA. Standard selectors include Hand/Off/Auto, Start/Stop, On/Off, Open/Close/Auto, Open/Close. Custom selector types may be created by manually entering up to 4 selection labels seperated by the “/” character. For example: Manual/Off/Auto/Monitor. The first selection will write a value of 1 to the PLC, the second a value of 0, the third a value of 2 and if a fourth selection is used it will write value of 3.

The default is to use the normal 2 bits for an HOA. PLCs can use other options if values or bit references are placed at the end of each label immediately following an equals sign.
For example: “Manual=10/Off=11/Auto=12” would set a PLC location to 10,11 or 12 depending on the selection.
“Manual=b1/Off=b2/Auto=b3” would set bit 1,2 or 3 in a PLC location depending on the selection (and clear just the other 2 bits).

Virtual HOAs

Like the Remote Setpoints described before, these “virtual” HOAs are read and sent to the remote RTU. The variables X9 thru X16 are used to represent 8 different HOA settings (Hand=1, Auto=2, Off=0). Both the Central PC HOAs and the Remote Virtual HOAs have a selection for what options are displayed in the drop-down list (HAND/OFF/AUTO, START/STOP, ON/OFF etc.).

Accumulators

Station - Pump Station #1

General | PLC | Analog Ins | Discretes | HOAs | Expansion | Flow | Analog Outs | Setpoints | **Accumulators**

Remote Accumulators

	Name	Units	Range
M0	Runtime 1	hrs	0.1
M1	Runtime 2	hrs	0.1
M2	Runtime 3	hrs	0.1
M3	Cycles 1		1
M4	Cycles 2		1
M5	Cycles 3		1
M6			0
M7			0

Accumulator Data Source: M0-M7

☒ Collect Accumulators at Midnight

☒ Auto-Adjust Maintenance Runtimes/Cycles with Accumulators

Close Save

Micro-Comm remote RTU variables X17-X24, M0-M7, M8-M15 or M16-M23 can be labeled, scaled and treated as accumulators (runtimes, cycle counters, flow totals etc). These variables are then read and sent on demand from SCADAview CSX just like the Remote Setpoints or Remote HOAs.

A special option is also available to automatically read and save these accumulators at midnight (for use with the “Accumulator Report”).

Another option allows the accumulators to automatically adjust the maintenance runtimes. After they are read at midnight, any of the accumulators that have “runtime” in their name will set the corresponding maintenance runtime equal to the remote value.

Control Group Setup

The screenshot shows a software window titled "Group - Pump Station #1". It contains several tabs: "General", "PLC", "Normal Group", "Custom Group Screen", and "Disable Help". The "General" tab is selected. Inside the "General" tab, there are two input fields: "Group #" with the value "1" and "Name" with the value "Pump Station #1". Below these is a "Data Source" dropdown menu currently set to "SV-PLC Server". There are two checkboxes: "Remote Group" and "Use Custom Group Screen", both of which are currently unchecked. At the bottom of the window, there is a status bar showing "1: Pump Station #1 (1)" and two buttons labeled "Close" and "Save".

Group

The control group number (1-99) for the currently displayed group. This number is assigned by Micro-Comm when a system is created and will usually range from 1 to the number of groups in the system.

Name

A label that describes the control group. This is normally the name of a pump station or controlled device.

Data Source

The SV-PLC server application will normally be used to acquire data for the control group. Currently the choices are "None / Data Entry" or "SV-PLC Server".

Remote Group

Checked if the control group is located at the remote (distributed control).

Use Custom Group Screen

When checked, the appearance of the control group screen will reflect what is selected under the Custom Group Screen tab - each setpoint line can be labeled and scaled differently with this option. Otherwise the group screen will be set up using the Normal Groups tab.

Normal Group Screen Setup

Controlling Levels		Controlling Level Labels	Setpoint Labels
Station	Analog	Label	Label
1 TH - Tower #1	All - Tower Level	1 North Tower	1 Lead Pump
2		2	2 Lag Pump
3		3	3
4		4	4
5		5	5
6		6	6
7		7	7
8		8	8

☐ Use analogs selected above to scale each line differently
(Normally all setpoints will be scaled based on the first level that is enabled. Note that if the option to scale each line differently is selected then the Time Inhibit/Restore/Prefill setpoints will not be scaled.)

Stop/Start Column Labels: Stop Start
Override Stop/Start Labels: Stop Start

1: Pump Station #1 (1)

Close Save

Controlling Levels

Station

The address and name of the station that controls the outputs for this control group. This information will tell SCADAview CSX what scaling factor to use when displaying the setpoints for the group. The scaling factor that will be used will also be based on which of the Controlling Levels (1-8) is selected on the Control Group Setpoints window.

Analog

The analog input and name used for control of this group. This information will along with the Controlling Station will tell SCADAview CSX what scaling factor to use when displaying the setpoints for this control group (unless the option below is checked).

Use analogs selected above to scale each stop/start line differently

This option makes it possible for each line on the control group stop/start screen to have a different scaling factor. Each line will be scaled using the selected station/analog.

Controlling Level Labels

Control groups can have up to 8 different controlling sites depending on how the system is set up. A label can be used to describe each controlling site. (TANK1, TH-A etc.)

Setpoint Labels

A label describing each controlled device in the group.

Example: Lead Pump, Lag Pump etc.

Stop/Start Labels

Special labels for display above the stop/start setpoints in SCADAview CSX. If something other than "Stop" and "Start" are desired (such as "Cutoff" and "Restore") enter the labels here.

Override Stop/Start Labels

Same as above but these labels are displayed above the override setpoints.

Custom Group Screen Setup

Group - Pump Station #1

General PLC Normal Group Custom Group Screen Disable Help

Custom Stops

Stop Label	Units	Range	Preset
1		0	0
2		0	0
3		0	0
4		0	0
5		0	0
6		0	0
7		0	0
8		0	0
9		0	0

Custom Starts

Start Label	Units	Range	Preset
1		0	0
2		0	0
3		0	0
4		0	0
5		0	0
6		0	0
7		0	0
8		0	0
9		0	0

☐ Show Fail Reset Button ☐ Show Alternator ☐ Custom Alternator

Setpoints Title:

Alternator Selections:

Alternator Label:

1: Pump Station #1 (1)

Custom Group Screens allow much more flexibility in how they are displayed in SCADAview CSX. The options are as follows:

Stop Label / Start Label

Custom labels for each stop or start setpoint (stops are on the left side of the control group screen and starts are on the right).

Units

The units label is displayed to the right of each setpoint entry edit field.

Range/Preset

The multipliers and offsets used to scale each setpoint. (scaled=(raw+preset)*range)

Show Fail Reset Button

If checked, the group's "Fail Reset" button is shown on the custom group screen.

Show Alternator

If checked, the "Forward, Reverse, Auto" selector is shown on the custom group screen.

Setpoints Title

This label is shown above all the setpoints - this can be left blank.

Alternator Selections

Custom text for auto, forward and reverse can be used. Separate each one with a slash "/".

Alternator Label

Custom text shown above the alternator drop-down menu.

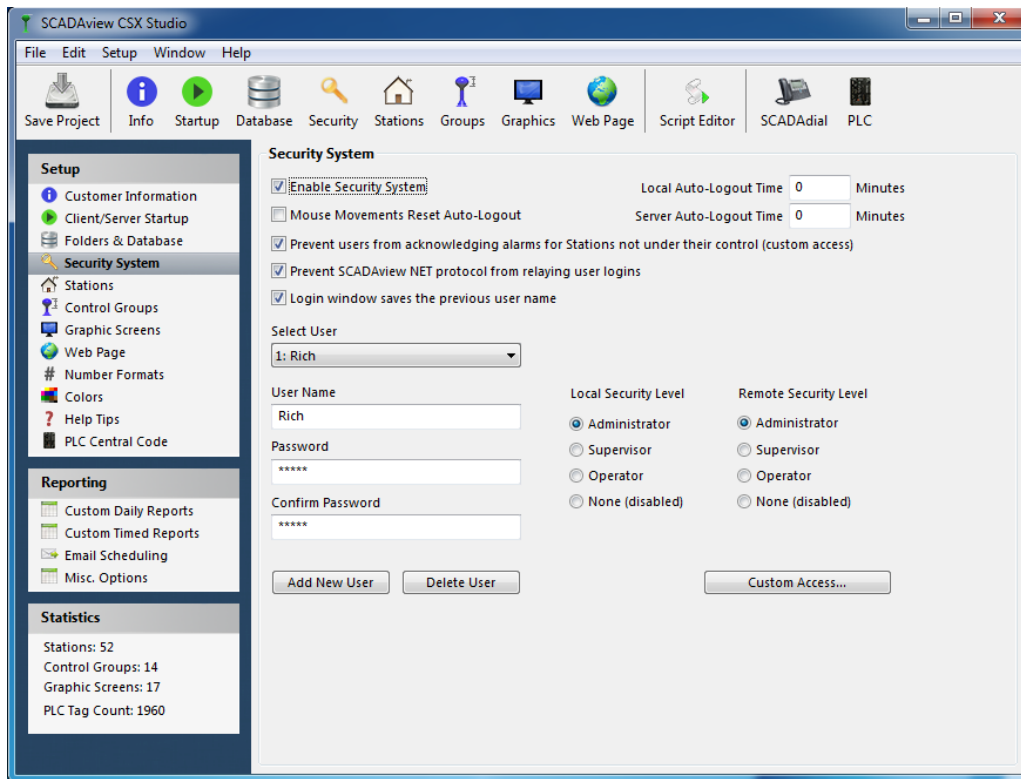
Notes:

Custom Group Screens can also use drop-down lists for setpoints instead of text boxes (for special mode selection). To specify the list, enclose it in braces and put it at the end of the setpoint label - formatted like {label1=value1;label2=value2;label3=value3 etc.} Example: Control Mode {Manual=1;Auto=2;Off=3}

The Custom Group setpoint labels can also be used to specify a minimum and maximum value allowed. To use this option, enclose a range in square brackets at the end of the setpoint label (Note: this will not be displayed on the control group screen). Example: Target Pressure [0-200]

These options can also be easily set up using a special window by right-clicking on the stop/start label and selecting "Edit Special Options..."

Security System



Select User

Use this pull-down list to select the user to edit.

Add New User

Click this button to add a new user to the end of the database.

Delete User

Deletes the currently selected user. Note: The user will not be deleted until the Save button is clicked.

Save Project

This toolbar button will save the entire user's database. You should click this when you are finished making changes.

Global Security System Options

Enable Security System

When this option is checked, all security features will be enabled for SCADAview CSX. Also, the next time the SCADAview CSX Studio is run it will require an administrator's user name and password. Be careful not to lock yourself out!

Local Auto-Logout Time

If a number other than zero is entered, SCADAview CSX will log off the current user after the given number of minutes has elapsed. This helps keep the system secure even if a user forgets to log out.

Server Auto-Logout Time

SCADAview CSX acting as the server will log out any remote logins after this amount of time. If set to 0 it will never log remote users out.

Mouse Movements Reset Auto-Logout

If selected, any time the user moves the mouse the local auto-logout timer will be re-started.

User Options

User Name

The name a user must type when logging into SCADAview CSX.

Password

The password a user must type when logging into SCADAview CSX.

Confirm

When changing or setting a password, it must be entered again here to confirm the change.

User's Security Level

Administrator

The user can do anything including changing setup options. (SCADAview CSX Studio requires at least one administrator)

Supervisor

Supervisors can change setpoints, HOA controls etc. Basically they can do everything other than program setup.

Operator

Operators can view the display screens, run reports etc. and can make changes to the Hand/Off/Auto controls. They can't change setpoints or program setup options.

None

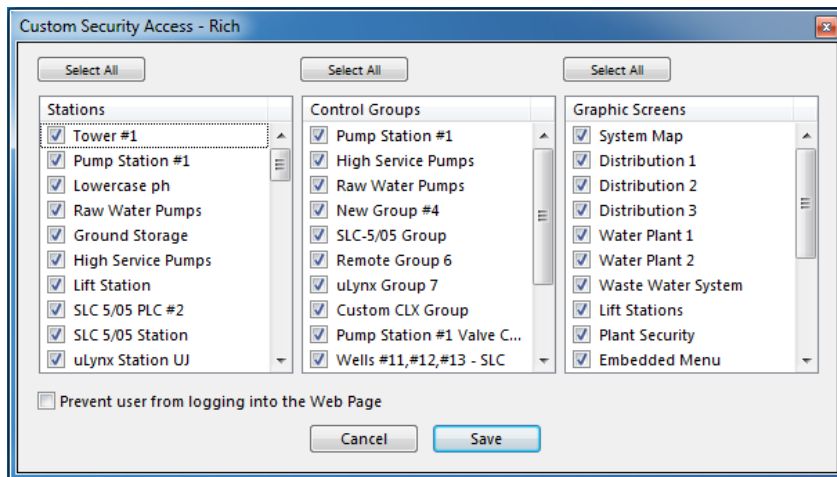
The user can log in but can't make any setpoint or HOA changes.

Note: When logged off, users can only view displays, view setpoints and HOAs and run reports.

Local vs. Remote Security Level

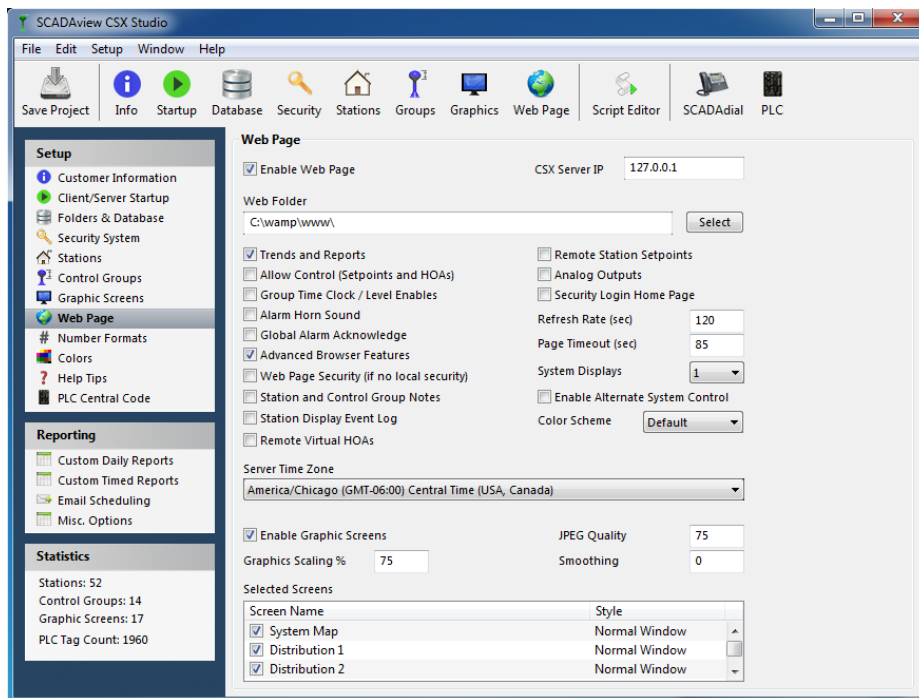
The local security level will be used whenever a user logs in on at the SCADAview CSX machine. The remote security level gets used when logging in over the web page or remotely using TCP/IP client/server or SCADAview NET data connections.

Custom Access...



The custom access option can be used block the user from making control changes on any station, group or graphic screen. It can also be used to keep the user from logging in on the web page.

Web Page Option

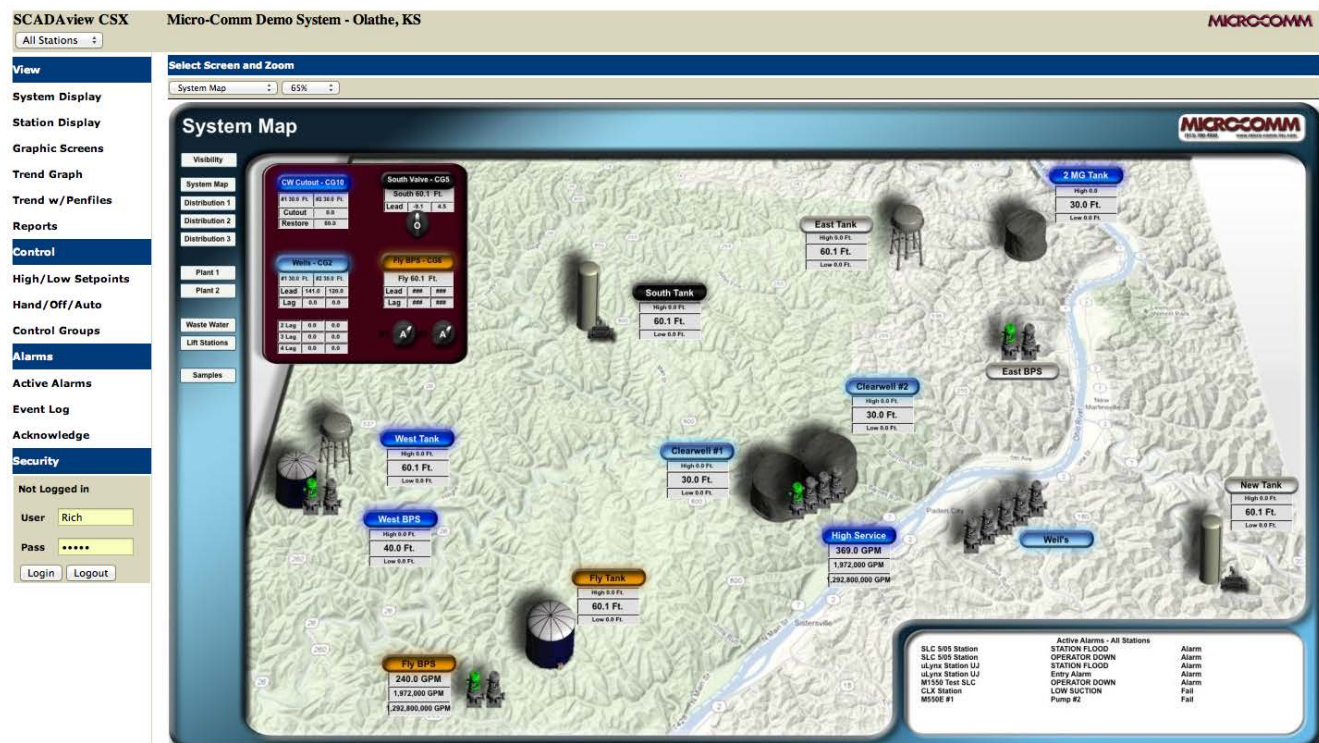


An optional add-on to SCADAview CSX can be used to generate Web page versions of the System Display screen, Station Display screens, selected Graphics screens, High/Low Alarms and Control Group setpoints, Hand/Off/Auto controls, Reports and Trend graphs and more. Current system data and alarms can then be viewed over the Internet using any Web browser such as Internet Explorer, Google Chrome, Firefox, Opera, Safari, etc.

Choose "Web Page" from the Setup menu in the SCADAview CSX Studio and check the various options desired.

Note: A web server application and PHP installation is required for the web page option to work. The "Web Folder" is a full pathname of the Web server's home page folder (where all .php files will be copied).

Some sample web pages are shown below:



SCADAview CSX

Micro-Comm Demo System - Olathe, KS

MICROCOMM

All Stations

View

System Display

Station Display

Graphic Screens

Trend Graph

Trend w/Penfiles

Reports

Control

High/Low Setpoints

Hand/Off/Auto

Control Groups

Alarms

Active Alarms

Event Log

Acknowledge

Security

Not Logged in

User Rich

Pass *****

LoginLogout

Station Display - High Service Pumps (HS)

High Service Pumps - (HS)

Levels	Value	Units	Status	Discretes	SYS HOA	RTU HOA	Mode	Status
Discharge Pressure	72.0	PSI		Pump #8	OFF		STBY	RUN
Surge Tank Level	54.0	INCH		Pump #9	OFF		STBY	OFF
Pump #8 Speed	76.8	%		Pump #10	OFF		STBY	OFF
Pump #9 Speed	0.0	%		Pump #11	OFF		STBY	OFF
Pump #10 Speed	0.0	%		Pump8 Hi/Lo PS				NORMAL
Pump #11 Speed	0.0	%		Pump9 Hi/Lo PS				NORMAL
Highmore BU Level	22.1	FT		Pump10 Hi/Lo PS				NORMAL
Highmore Control Level	0.0	FT		Pump11 Hi/Lo PS				NORMAL

Flow Rates and Totals	Value	Units	Status

Discretes 9-16	Status	Expansion 1-8	Status	Expansion 9-16	Status	Expansion 17-24	Status	Expansion 25-32	Status	Station Status
VFD #8 FAULT	NORMAL	Pump #8 HAND		PLC Panel Power		Surge HIGH LVL				Data Valid
VFD #9 FAULT	NORMAL	Pump #8 AUTO		S3000 LOS		Surge LOW LEVEL				Time 11:01:11a
VFD #10 FAULT	NORMAL	Pump #9 HAND		Discharg Analog		Surge LOW AIR				Date 4-4-13
VFD #11 FAULT	NORMAL	Pump #9 AUTO		Surge Analog		Surge LOW OIL				
Pump #8 Cycle	ENABLE	Pump #10 HAND		Pump #8 Analog						
Pump #9 Cycle	ENABLE	Pump #10 AUTO		Pump #9 Analog						
Pump #10 Cycle	ENABLE	Pump #11 HAND		Pump #10 Analog						
Pump #11 Cycle	ENABLE	Pump #11 AUTO		Pump #11 Analog						

SCADAview CSX

Micro-Comm Demo System - Olathe, KS

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Active Alarms

Event Log

Acknowledge

Security

Not Logged in

User Rich

Pass *****

LoginLogout

Trend Graph - Tower #1 (TH)

Station Name Tower #1 - (TH)

Input Name Tower Level

Month April

Day 4

Year 2013

Type 1 Day

Tower #1 - Tower Level

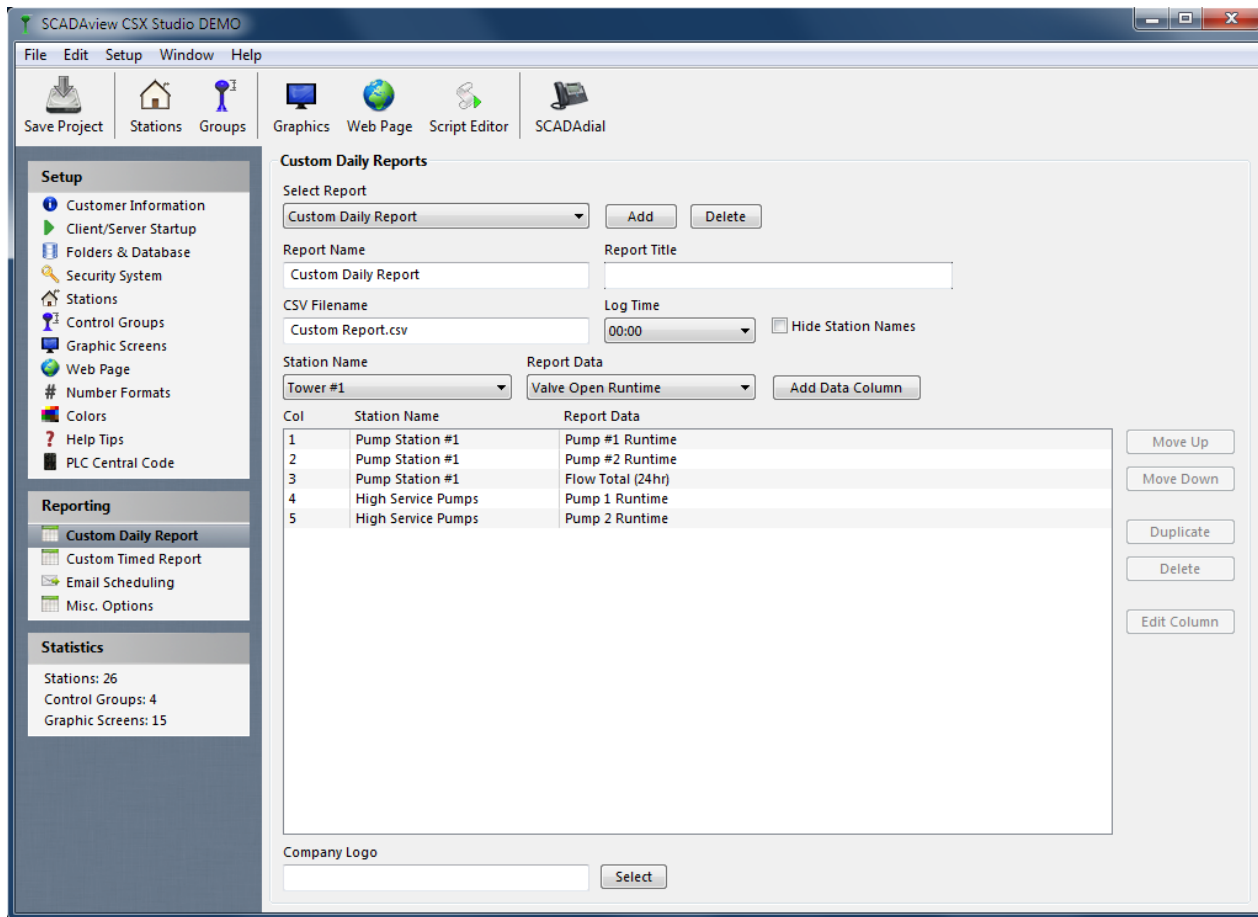
4-4-2013
5:12 am
86.2 ft

Date: 04-04-2013

Hours

High: 89.8, Low: 60.0, Avg: 74.967

Custom Daily Reports

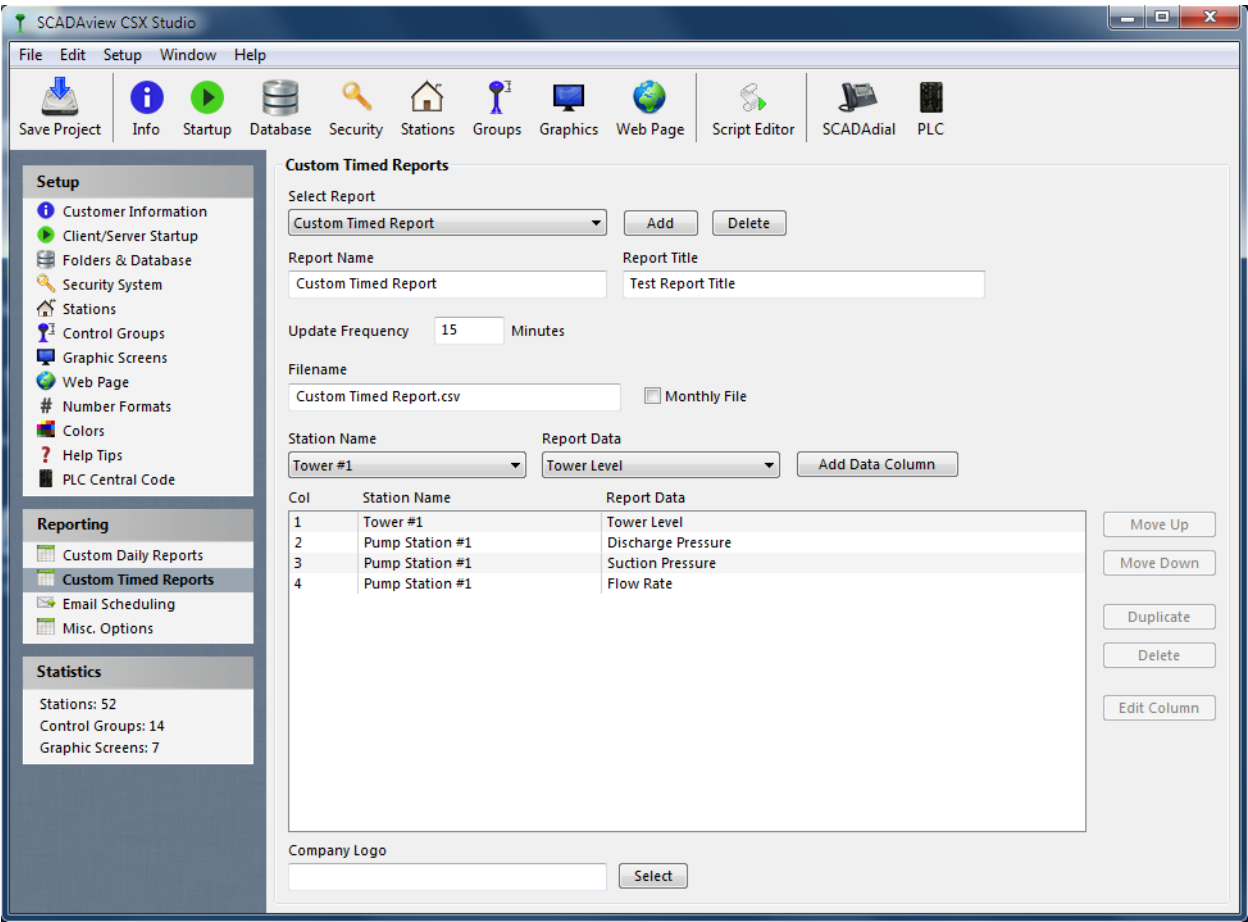


This reporting option is defined by selecting “Custom Daily Report” from the Setup menu in SCADAview CSX Studio.

Up to 50 user-defined Daily Reports can be updated every midnight (or at a custom Log Time) with 24-hour summary data columns. The stations and data points can be selected for up to 250 columns to be written to a comma-separated file (Microsoft Excel compatible). The first column in the report will always be the date in the format MM/DD/YYYY.

SQL database servers can also be updated with this data if so desired. Use “Folders & Database” to set up the connection. Supported servers include ODBC, Microsoft SQL, PostgreSQL and MySQL.

Custom Timed Reports

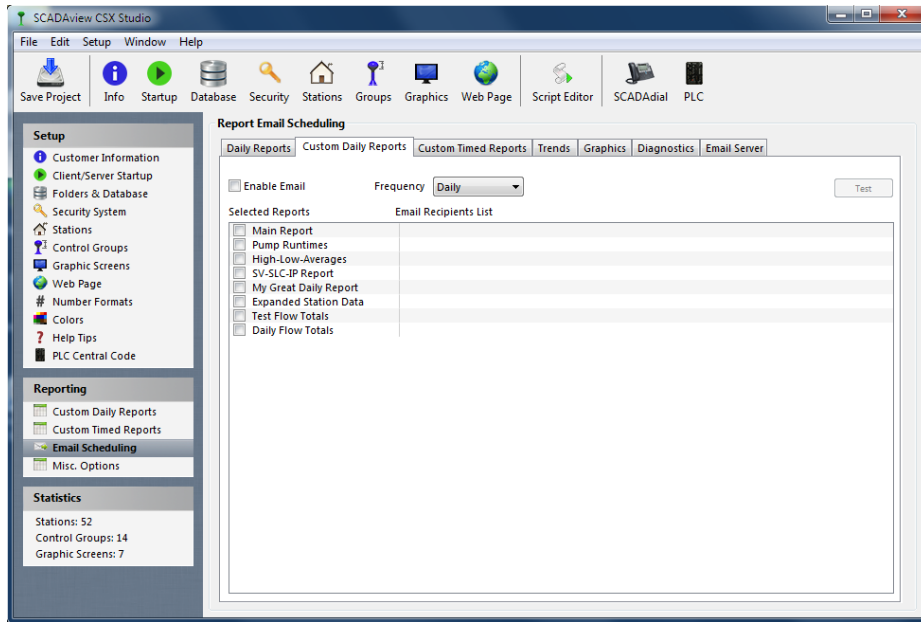


Up to 50 user-defined Timed Reports can be updated at any given rate with live station data. The stations and data points can be selected for up to 250 columns to be written to a comma-separated file (Microsoft Excel compatible). If “Monthly File” is checked, a new file will be started each month and the filename will end with MM-YYYY (month-year).

This reporting option is defined by selecting “Custom Timed Reports” from the Setup menu in SCADAview CSX Studio.

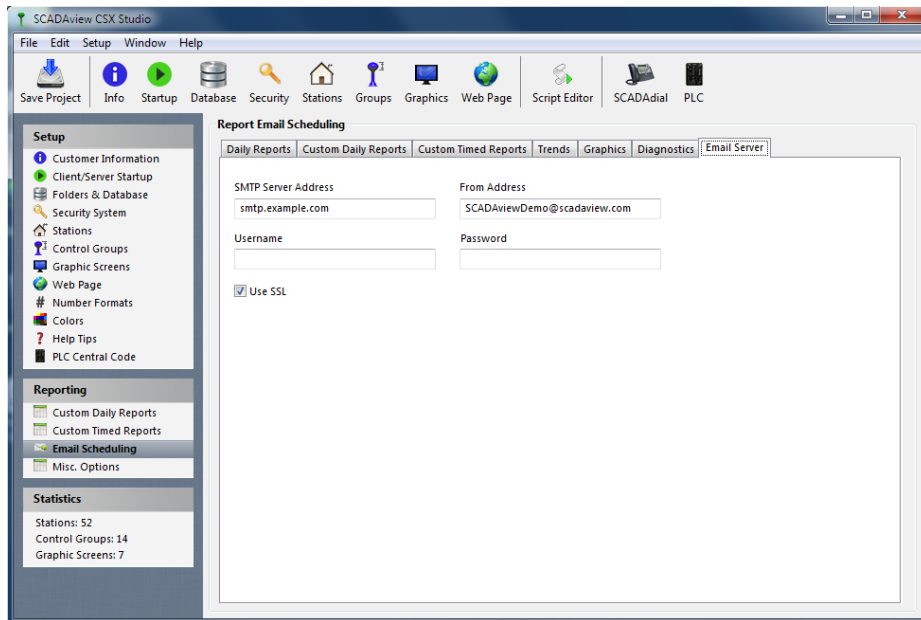
SQL database servers can also be updated with this data if so desired. Use “Folders & Database” to set up the connection.

Report Email Scheduling



Daily, Custom Daily, Custom Timed, Graphic Screen, Trends and Radio Diagnostic can optionally be emailed to operators on a daily, weekly or monthly basis. Simply select “Enable Email” for the report type in question, select the reports and type in the email addresses separated by commas as shown in the example above. The Daily email will be sent just after midnight each day. Weekly email will be sent out on Monday morning and Monthly will be sent on the 1st of each month with the previous month’s report. Note: If an email address of “LocalPrinter” is used instead of an email address, the default local printer will be used.

In order to email the reports, SCADAview CSX needs to also have your email server settings. You may need to contact your network system administrator to get this info. SCADAview CSX will also use these settings whenever it needs to email anything else (CSX Script may be used to send email).



SQL Database Structure

The following information describes the structure of the various tables and fields within those tables that are created when using the SQL database server logging options. These examples are using the MySQL database server in conjunction with an open-source web application called “phpmyadmin” to export the table information along with 10 rows of demo data.

Station Address “PH” 1-Minute Historical Data:

```
--
-- Table structure for table `SVStatLogPH`
--

CREATE TABLE IF NOT EXISTS `SVStatLogPH` (
  `ID` int(11) NOT NULL AUTO_INCREMENT,
  `DT` timestamp NOT NULL DEFAULT CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP,
  `AI1` double DEFAULT NULL,
  `AI2` double DEFAULT NULL,
  `AI3` double DEFAULT NULL,
  `AI4` double DEFAULT NULL,
  `AI5` double DEFAULT NULL,
  `AI6` double DEFAULT NULL,
  `AI7` double DEFAULT NULL,
  `AI8` double DEFAULT NULL,
  `Flow_Rate` double DEFAULT NULL,
  `Flow_Total` double DEFAULT NULL,
  `DI1` smallint(1) DEFAULT NULL,
  `DI2` smallint(1) DEFAULT NULL,
  `DI3` smallint(1) DEFAULT NULL,
  `DI4` smallint(1) DEFAULT NULL,
  `DI5` smallint(1) DEFAULT NULL,
  `DI6` smallint(1) DEFAULT NULL,
  `DI7` smallint(1) DEFAULT NULL,
  `DI8` smallint(1) DEFAULT NULL,
  `DI9` smallint(1) DEFAULT NULL,
  `DI10` smallint(1) DEFAULT NULL,
  `DI11` smallint(1) DEFAULT NULL,
  `DI12` smallint(1) DEFAULT NULL,
  `DI13` smallint(1) DEFAULT NULL,
  `DI14` smallint(1) DEFAULT NULL,
  `DI15` smallint(1) DEFAULT NULL,
  `DI16` smallint(1) DEFAULT NULL,
  `EI1` smallint(1) DEFAULT NULL,
  `EI2` smallint(1) DEFAULT NULL,
  `EI3` smallint(1) DEFAULT NULL,
  `EI4` smallint(1) DEFAULT NULL,
  `EI5` smallint(1) DEFAULT NULL,
  `EI6` smallint(1) DEFAULT NULL,
  `EI7` smallint(1) DEFAULT NULL,
  `EI8` smallint(1) DEFAULT NULL,
  `EI9` smallint(1) DEFAULT NULL,
  `EI10` smallint(1) DEFAULT NULL,
  `EI11` smallint(1) DEFAULT NULL,
  `EI12` smallint(1) DEFAULT NULL,
  `EI13` smallint(1) DEFAULT NULL,
  `EI14` smallint(1) DEFAULT NULL,
  `EI15` smallint(1) DEFAULT NULL,
  `EI16` smallint(1) DEFAULT NULL,
  `EI17` smallint(1) DEFAULT NULL,
  `EI18` smallint(1) DEFAULT NULL,
  `EI19` smallint(1) DEFAULT NULL,
  `EI20` smallint(1) DEFAULT NULL,
  `EI21` smallint(1) DEFAULT NULL,
  `EI22` smallint(1) DEFAULT NULL,
  `EI23` smallint(1) DEFAULT NULL,
  `EI24` smallint(1) DEFAULT NULL,
  `EI25` smallint(1) DEFAULT NULL,
  `EI26` smallint(1) DEFAULT NULL,
  `EI27` smallint(1) DEFAULT NULL,
  `EI28` smallint(1) DEFAULT NULL,
  `EI29` smallint(1) DEFAULT NULL,
  `EI30` smallint(1) DEFAULT NULL,
  `EI31` smallint(1) DEFAULT NULL,
  `EI32` smallint(1) DEFAULT NULL,
  PRIMARY KEY (`ID`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1 AUTO_INCREMENT=26207 ;

--
-- Dumping data for table `SVStatLogPH`
--

INSERT INTO `SVStatLogPH` (`ID`,`DT`,`AI1`,`AI2`,`AI3`,`AI4`,`AI5`,`AI6`,`AI7`,`AI8`,`Flow_Rate`,`Flow_Total`,`DI1`,`DI2`,`DI3`,`DI4`,`DI5`,`DI6`,`DI7`,`DI8`,`DI9`,`DI10`,`DI11`,`DI12`,`DI13`,`DI14`,`DI15`,`DI16`,`EI1`,`EI2`,`EI3`,`EI4`,`EI5`,`EI6`,`EI7`,`EI8`,`EI9`,`EI10`,`EI11`,`EI12`,`EI13`,`EI14`,`EI15`,`EI16`,`EI17`,`EI18`,`EI19`,`EI20`,`EI21`,`EI22`,`EI23`,`EI24`,`EI25`,`EI26`,`EI27`,`EI28`,`EI29`,`EI30`,`EI31`,`EI32`) VALUES
```


Station Address “PH” 1-Minute Historical Expanded Data:

```
--
-- Dumping data for table `SVStatLogExpPH`
--
```

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Station Address "PH" Daily Pump Report:

```
--
-- Table structure for table `SVDailyPumpReportPH`
--

CREATE TABLE IF NOT EXISTS `SVDailyPumpReportPH` (
  `ID` int(11) NOT NULL AUTO_INCREMENT,
  `DT` timestamp NOT NULL DEFAULT CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP,
  `PUMP1` double DEFAULT NULL,
  `PUMP2` double DEFAULT NULL,
  `PUMP3` double DEFAULT NULL,
  `PUMP4` double DEFAULT NULL,
  `PUMP5` double DEFAULT NULL,
  `PUMP6` double DEFAULT NULL,
  `PUMP7` double DEFAULT NULL,
  `PUMP8` double DEFAULT NULL,
  `FT24` double DEFAULT NULL,
  `FRMIN` double DEFAULT NULL,
  `FRMAX` double DEFAULT NULL,
  `FRAVG` double DEFAULT NULL,
  PRIMARY KEY (`ID`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1 AUTO_INCREMENT=19 ;

--
-- Dumping data for table `SVDailyPumpReportPH`
--

INSERT INTO `SVDailyPumpReportPH` (`ID`, `DT`, `PUMP1`, `PUMP2`, `PUMP3`, `PUMP4`, `PUMP5`, `PUMP6`, `PUMP7`, `PUMP8`, `FT24`, `FRMIN`, `FRMAX`, `FRAVG`) VALUES
(1, '2012-07-02 04:59:59', 6.3, 7.3, 0, 12.05, 0, 0, 12.03, 11.95, 4444000, 239, 390, 315.5833),
(2, '2012-07-03 04:59:59', 5.97, 7.82, 0, 12.03, 0, 0, 11.9, 11.98, 4426000, 239, 390, 313.4917),
(3, '2012-07-04 04:59:59', 6.65, 7.42, 0, 11.98, 0, 0, 11.98, 12, 4435000, 239, 390, 314.4507),
(4, '2012-07-05 04:59:59', 7.18, 6.4, 0, 12, 0, 0, 12.02, 11.98, 4443000, 239, 390, 315.5326),
(5, '2012-07-06 04:59:59', 7.7, 6.12, 0, 12, 0, 0, 11.95, 12.08, 4425000, 239, 389, 313.4278),
(6, '2012-07-07 04:59:59', 7.5, 6.55, 0, 11.97, 0, 0, 12, 12, 4436000, 239, 390, 314.5549),
(7, '2012-07-08 04:59:59', 6.47, 7.05, 0, 11.98, 0, 0, 12.12, 11.95, 4444000, 239, 390, 315.4972),
(8, '2012-07-09 04:59:59', 6.2, 7.62, 0, 12.05, 0, 0, 12, 11.9, 4424000, 239, 390, 313.4035),
(9, '2012-07-10 04:59:59', 6.52, 7.53, 0, 11.95, 0, 0, 12.02, 12, 4437000, 239, 390, 314.6729),
(10, '2012-07-11 04:59:59', 7.03, 6.55, 0, 12.02, 0, 0, 11.95, 12.08, 4443000, 239, 390, 315.4167);
```

Sample Custom Daily Report #5

(includes 3 discrete input runtimes, flow rate low,high,avg and flow total)

```
--
-- Table structure for table `SVCustomDailyReport5`
--

CREATE TABLE IF NOT EXISTS `SVCustomDailyReport5` (
  `ID` int(11) NOT NULL AUTO_INCREMENT,
  `DT` timestamp NOT NULL DEFAULT CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP,
  `PH_DI1_Runtime` double DEFAULT NULL,
  `PH_DI2_Runtime` double DEFAULT NULL,
  `PH_DI3_Runtime` double DEFAULT NULL,
  `PH_Flow_Rate_Low` double DEFAULT NULL,
  `PH_Flow_Rate_High` double DEFAULT NULL,
  `PH_Flow_Rate_NZAvg` double DEFAULT NULL,
  `PH_Flow_Total` double DEFAULT NULL,
  PRIMARY KEY (`ID`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1 AUTO_INCREMENT=66 ;

--
-- Dumping data for table `SVCustomDailyReport5`
--

INSERT INTO `SVCustomDailyReport5` (`ID`, `DT`, `PH_DI1_Runtime`, `PH_DI2_Runtime`, `PH_DI3_Runtime`, `PH_Flow_Rate_Low`, `PH_Flow_Rate_High`, `PH_Flow_Rate_NZAvg`, `PH_Flow_Total`) VALUES
(1, '2012-07-10 04:59:59', 6.52, 7.53, 0, 239, 390, 314.6729, 4437000),
(2, '2012-07-11 04:59:59', 7.03, 6.55, 0, 239, 390, 315.4167, 4443000),
(3, '2012-07-12 04:59:59', 7.5, 6.32, 0, 239, 390, 313.3521, 4424000),
(4, '2012-07-13 04:59:59', 7.57, 6.48, 0, 239, 390, 314.7507, 4437000),
(5, '2012-07-14 04:59:59', 6.65, 6.87, 0, 239, 390, 315.3315, 4443000),
(6, '2012-07-15 04:59:59', 6.42, 7.43, 0, 239, 390, 313.3444, 4423000),
(7, '2012-07-16 04:59:59', 6.48, 7.57, 0, 239, 390, 314.8632, 4439000),
(8, '2012-07-17 04:59:59', 6.73, 6.75, 0, 239, 390, 315.2986, 4442000),
(9, '2012-07-18 04:59:59', 7.32, 6.55, 0, 239, 390, 313.3222, 4423000),
(10, '2012-07-19 04:59:59', 7.5, 6.55, 0, 239, 390, 314.941, 4439000);
```

Active Station Data

```
--  
-- Table structure for table `SVActiveStationData`  
--  
  
CREATE TABLE IF NOT EXISTS `SVActiveStationData` (  
  `ID` int(11) NOT NULL AUTO_INCREMENT,  
  `DT` timestamp NOT NULL DEFAULT CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP,  
  `SADDR` char(2) DEFAULT NULL,  
  `A11` double DEFAULT NULL,  
  `A12` double DEFAULT NULL,  
  `A13` double DEFAULT NULL,  
  `A14` double DEFAULT NULL,  
  `A15` double DEFAULT NULL,  
  `A16` double DEFAULT NULL,  
  `A17` double DEFAULT NULL,  
  `A18` double DEFAULT NULL,  
  `A19` double DEFAULT NULL,  
  `A110` double DEFAULT NULL,  
  `A111` double DEFAULT NULL,  
  `A112` double DEFAULT NULL,  
  `A113` double DEFAULT NULL,  
  `A114` double DEFAULT NULL,  
  `A115` double DEFAULT NULL,  
  `A116` double DEFAULT NULL,  
  `Flow_Rate` double DEFAULT NULL,  
  `Flow_Total` double DEFAULT NULL,  
  `Flow_Rate_2` double DEFAULT NULL,  
  `Flow_Total_2` double DEFAULT NULL,  
  `Flow_Rate_3` double DEFAULT NULL,  
  `Flow_Total_3` double DEFAULT NULL,  
  `Flow_Rate_4` double DEFAULT NULL,  
  `Flow_Total_4` double DEFAULT NULL,  
  `Flow_Rate_5` double DEFAULT NULL,  
  `Flow_Total_5` double DEFAULT NULL,  
  `Flow_Rate_6` double DEFAULT NULL,  
  `Flow_Total_6` double DEFAULT NULL,  
  `Flow_Rate_7` double DEFAULT NULL,  
  `Flow_Total_7` double DEFAULT NULL,  
  `Flow_Rate_8` double DEFAULT NULL,  
  `Flow_Total_8` double DEFAULT NULL,  
  `DI1` smallint(1) DEFAULT NULL,  
  `DI2` smallint(1) DEFAULT NULL,  
  `DI3` smallint(1) DEFAULT NULL,  
  `DI4` smallint(1) DEFAULT NULL,  
  `DI5` smallint(1) DEFAULT NULL,  
  `DI6` smallint(1) DEFAULT NULL,  
  `DI7` smallint(1) DEFAULT NULL,  
  `DI8` smallint(1) DEFAULT NULL,  
  `DI9` smallint(1) DEFAULT NULL,  
  `DI10` smallint(1) DEFAULT NULL,  
  `DI11` smallint(1) DEFAULT NULL,  
  `DI12` smallint(1) DEFAULT NULL,  
  `DI13` smallint(1) DEFAULT NULL,  
  `DI14` smallint(1) DEFAULT NULL,  
  `DI15` smallint(1) DEFAULT NULL,  
  `DI16` smallint(1) DEFAULT NULL,  
  `EI1` smallint(1) DEFAULT NULL,  
  `EI2` smallint(1) DEFAULT NULL,  
  `EI3` smallint(1) DEFAULT NULL,  
  `EI4` smallint(1) DEFAULT NULL,  
  `EI5` smallint(1) DEFAULT NULL,  
  `EI6` smallint(1) DEFAULT NULL,  
  `EI7` smallint(1) DEFAULT NULL,  
  `EI8` smallint(1) DEFAULT NULL,  
  `EI9` smallint(1) DEFAULT NULL,  
  `EI10` smallint(1) DEFAULT NULL,  
  `EI11` smallint(1) DEFAULT NULL,  
  `EI12` smallint(1) DEFAULT NULL,  
  `EI13` smallint(1) DEFAULT NULL,  
  `EI14` smallint(1) DEFAULT NULL,  
  `EI15` smallint(1) DEFAULT NULL,  
  `EI16` smallint(1) DEFAULT NULL,  
  `EI17` smallint(1) DEFAULT NULL,  
  `EI18` smallint(1) DEFAULT NULL,  
  `EI19` smallint(1) DEFAULT NULL,  
  `EI20` smallint(1) DEFAULT NULL,  
  `EI21` smallint(1) DEFAULT NULL,  
  `EI22` smallint(1) DEFAULT NULL,  
  `EI23` smallint(1) DEFAULT NULL,  
  `EI24` smallint(1) DEFAULT NULL,  
  `EI25` smallint(1) DEFAULT NULL,  
  `EI26` smallint(1) DEFAULT NULL,  
  `EI27` smallint(1) DEFAULT NULL,  
)
```

```
--
-- Dumping data for table `SVActiveStationData`
--
```

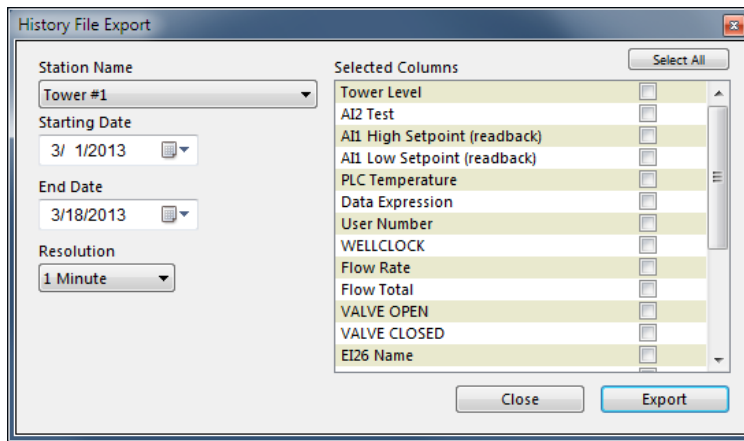
Sample Custom Timed Report
(includes a few analog input and flow rates logged at 15 minute intervals)

```
--
-- Table structure for table `SVCcustomTimedReport`
--
```

```
--
-- Dumping data for table `SVCcustomTimedReport`
--
```

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Exporting Historical Data



Station data for a given period of time can be exported to a .csv file for use in another program such as Microsoft Excel. Select the “Export History Files” from the Files menu in SCADAview CSX Studio. The following options are available:

Station Name

The name of the station with the data to be exported.

Starting / End Date

Starting and ending Month, Day and Year for the exported data.

Selected Columns

Only the input names checked will be exported to the file in the order listed.

Resolution

Time step for the exported data (1 Minute is the maximum resolution).

Script Language

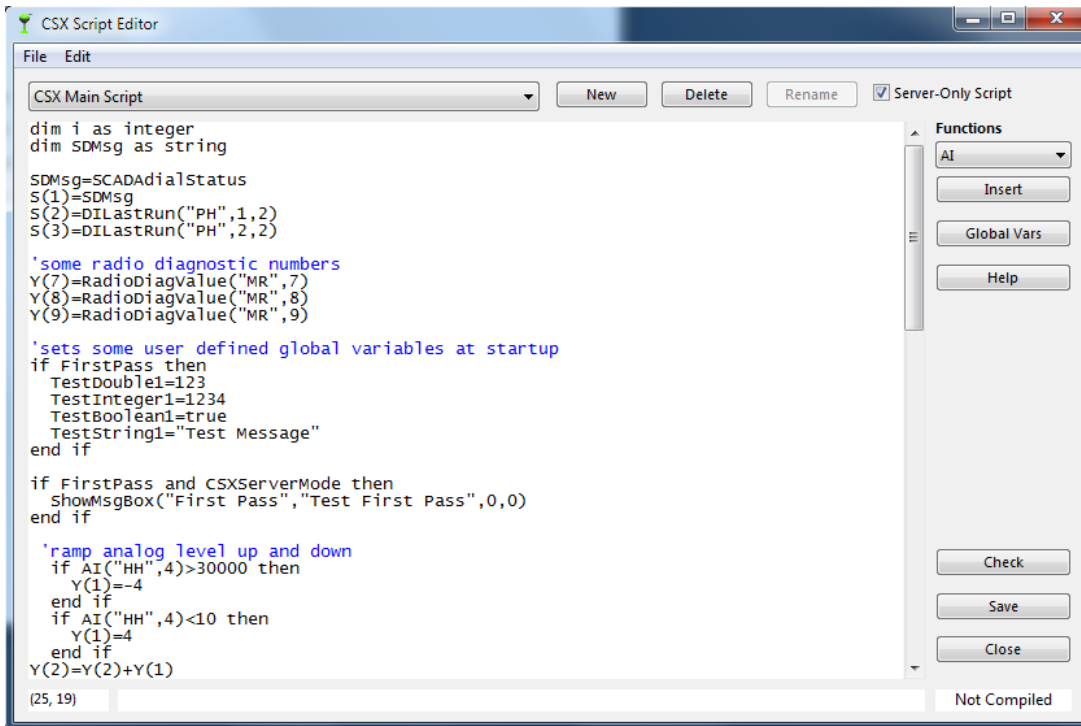
SCADAview CSX uses a scripting language that is much like Microsoft's Visual Basic or similar variants.

Scripts can be run as graphics click actions, whenever a station's data changes or continuously in a main script (every second).

Scripts can optionally be set to only run on a SCADAview CSX server. This may be necessary when a script is doing server related tasks such as custom data logging or e-mail messaging.

Script Editor

SCADAview CSX Studio provides a script editor (sample shown below) that functions much like any other text edit. Syntax help for the currently selected function is shown at the bottom and a list of all available functions is on the right. Clicking the "Check" button will compile the script being edited - making sure all syntax is correct.



Variables and Constants

All numeric and alphanumeric operators are supported:

+, -, *, /, %, Mod, <, =, >, <=, >=, <>.

Logical operators: And, Not, Or.

Several forms of comments are supported: ', //, and REM.

Data Types

CSX Script supports the following data types: Integer, Single, Double, Boolean, String

Arrays can use any of these types.

Control Structures

All the control structures specified in this Language Reference are supported. This includes:

Function...

Sub...

For... Next

Do... Loop

If... Then... Else... Elseif... End If

Select Case... End Select

While...Wend

Return statement

Standard (BASIC Language) Functions

Function Definition	Description
Abs(Double) As Double	Returns the absolute value of the number specified.
Acos(Double) As Double	Returns the arccosine of the value specified. The arccosine is the angle whose cosine is value. The returned angle is given in radians.
Asc(String) As Integer	Returns as an Integer, the ASCII value for the first character of a String.
Asin(Double) As Double	Returns the arcsine of the value specified.
Atan(Double) As Double	Returns the arctangent of the value specified. The arctangent is the angle whose tangent is value.
Atan2(Double, Double) As Double	Returns the arctangent of the point whose coordinates are x and y. The arctangent is the angle from the x-axis to a line drawn through the origin (0,0) and a point with coordinates x, y.
ByRef keyword	Used to pass a parameter by reference.
ByVal keyword	Used to pass a parameter by value.
CDBl(String) As Double	Returns the numeric equivalent of the passed string.
Ceil(Double) As Double	Returns the value specified rounded up to the nearest integer.
Chr(Double) As String	Returns the character whose ASCII value is passed.
CMY	Returns a Color based on the CMY (cyan, magenta, yellow) color model.
Color	A Color is an intrinsic data type that consists of three bytes that define the color.
Const name = value	Declares a value as a local constant.
Cos(Double) As Double	Returns the cosine of the given angle.
CountFields(String, String) As Integer	Returns the number of values (fields) in the string passed that are separated by the separator string passed.
Dim	Creates a local variable or array with the name and size (in the case of an array) and data type specified.
Do...Loop	Repeatedly executes a series of statements while a specified condition is True.
Exit	Causes control to exit a loop and jump to another line of code without the loop conditions being satisfied.
Exp(Double) As Double	eturns "e to the power of the value specified.
False	Used to set Boolean variables or properties. False is the result of a comparison of two objects that are not equal.
Floor(Double) As Double	Returns the value specified rounded down to the nearest Integer.
For...Next	Executes a series of statements a specified number of times.
Format(Double, String) As String	Returns as a string a formatted version of the number passed based on the parameters specified. The Format function is similar to the way spreadsheet applications format numbers.

Function ... End Function	Declares the name, parameters, returned value, and code that form the body of a function (method that returns a value).
GOTO keyword	Jumps to a statement label.
Hex(Integer) As String	Returns as a String the hexadecimal version of the number passed.
HSV	Returns a Color object based on the HSV (hue, saturation, value) color model.
If...Then...Else	Conditionally executes a group of statements, depending on the value of a boolean expression.
InStr(Integer, String, String) As Integer	Returns the position of the first occurrence of a string inside another string. The first character is numbered 1.
IsA operator	Used to determine the class of a particular object reference.
Left(String, Integer) As String	Returns the first n characters in a source string.
Len(String) As Integer	Returns the number of characters in the specified string.
Log(Double) As Double	Returns the natural logarithm of the value specified.
Lowercase(String) As String	Converts the given string to all lowercase characters.
LTrim(String) As String	Returns the string passed with leading (left side) whitespaces removed.
Max(Double, Double) As Double	Returns the largest value passed to it.
Microseconds As Double	Returns the number of microseconds (1,000,000th of a second) that have passed since the user's computer was started.
Mid(String, Integer, Integer) As String	Returns a portion of a string. The first character is numbered 1.
Min(Double, Double) As Double	Returns the smallest of the numbers passed.
Nil	Used to determine if an object is nil (no value).
NthField(String, String, Integer) As String	Returns a field from a row of data. The first field is numbered 1.
Oct(Integer) As String	Returns as a string, the octal version of the number passed.
Pow(Double, Double) As Double	Returns the value specified raised to the power specified.
Redim	Resizes the passed array. Arrays are zero-based.
Rem	Used to add comments to your code. (can also use // or ')
Replace(String, String, String) As String	Replaces the first occurrence of a string with another string.
ReplaceAll(String, String, String) As String	Replaces all occurrences of a string with another string.
RGB	Returns a Color based on the RGB (red, green, blue) color model.
Right(String, Integer) As String	Returns the last n characters from the string specified.
Rnd As Double	Returns a randomly generated number in the range $0 \leq \text{Rnd} < 1$.
Round(Double) As Double	Returns the passed value rounded to the nearest Integer.
RTrim(String) As String	Returns the string data type passed with trailing (right side) whitespaces removed.

Select Case	Executes one of several groups of statements, depending on the value of an expression.
Sin(Double) As Double	Returns the sine of the value specified.
Sqrt(Double) As Double	Returns the square root of the value specified.
Str(Double) As String	Returns the string form of the value passed.
StrComp(String, String, Integer) As Integer	Makes a binary (case-sensitive) or text (lexicographic) comparison of the two strings passed and returns the result.
Sub ... End Sub	Declares the name, parameters, and code that form the body of a subroutine (method).
Tan(Double) As Double	Returns the tangent of the angle specified.
Ticks as Integer	Returns the number of ticks (60th of a second) that have passed since the user's computer was started.
Titlecase(String) As String	Returns the string passed to it with all alphabetic characters in Titlecase.
Trim(String) As String	Returns the string passed with leading and trailing whitespaces removed.
True	Used to set a Boolean object to the value of "True" or test whether an existing Boolean expression is equal to True.
Ubound(array) As Integer	Returns the index of the last element in an array. Arrays are zero-based. Element zero may or may not be used.
Uppercase(String) As String	Converts the given string to all uppercase characters.
Val(String) As Double	Returns the numeric form of a string.
While...Wend	Repeatedly executes a series of statements while a specified condition is True.

SCADView CSX Station and Group Data Functions

Function Definition	Description
AI(saddr as string, ai as integer) as double	Station analog input value given the address and input number.
AO(saddr as string, ao as integer) as double	Station analog output value given the address and output number.
CGAENABLE(cg as integer, ae as integer) as integer	Control group analog enable value (1 or 0) given the group number and enable number.
CGALT(cg as integer) as integer	Control group alternator value given the group number. (1=forward, 2=reverse, 3=auto)
CGPREFILL(cg as integer) as double	Control group prefill value given the group number.
CGRESET(cg as integer) as integer	Control group reset value given the group number.
CGSTART(cg as integer, start as integer) as double	Control group start value given the group number and start number.
CGSTOP(cg as integer, stop as integer) as double	Control group stop value given the group number and start number.
CGTIHR(cg as integer) as integer	Control group time inhibit hours value given the group number.

CGTIMN(cg as integer) as integer	Control group time inhibit minutes value given the group number.
CGTRHR(cg as integer) as integer	Control group time restore hours value given the group number.
CGTRMN(cg as integer) as integer	Control group time restore minutes value given the group number.
DBAND(saddr as string, ai as integer) as double	Station analog input high-low deadband value given the address and input number.
DI(saddr as string, di as integer) as integer	Station discrete input value (1 or 0) given the address and input number.
DICycles(saddr as string, di as integer) as integer	Maintenance system cycle count for the given station and input.
DICyclesAlarm(saddr as string, di as integer) as integer	Maintenance system cycle alarm bit (1 or 0) for the given station and input.
DICyclesSetpoint(saddr as string, di as integer) as integer	Maintenance system cycle alarm setpoint for the given station and input.
DILastRun(saddr as string, di as integer, fmt as integer) as string	Maintenance system Last Run date / time string in either SQLDate-Time format (YYYY-MM-DD HH:MM:SS) with 0 for fmt, or other formats: 1=ShortDate+ShortTime, 2=LongDate+LongTime, 3=ShortDate, 4=LongDate, 5=ShortTime, 6=LongTime
DIRuntime(saddr as string, di as integer) as double	Maintenance system runtime in hours for the given station and input.
DIRuntimeAlarm(saddr as string, di as integer) as integer	Maintenance system runtime alarm bit (1 or 0) for the given station and input.
DIRuntimeSetpoint(saddr as string, di as integer) as double	Maintenance system runtime alarm setpoint in hours for the given station and input.
DOCALL(saddr as string, do as integer) as integer	Station discrete output call bit (1 or 0) given the address and input number.
DODSBL(saddr as string, do as integer) as integer	Station discrete output disabled bit (1 or 0) given the address and input number.
DOFAIL(saddr as string, do as integer) as integer	Station discrete output failed bit (1 or 0) given the address and input number.
DORUN(saddr as string, do as integer) as integer	Station discrete output run bit (1 or 0) given the address and input number.
DOGD(saddr as string, do as integer) as integer	Station discrete output group disable bit (1 or 0) given the address and input number.
DOAD(saddr as string, do as integer) as integer	Station discrete output analog disable bit (1 or 0) given the address and input number.
DOPD(saddr as string, do as integer) as integer	Station discrete output pump disable bit (1 or 0) given the address and input number.
DOTD(saddr as string, do as integer) as integer	Station discrete output timeclock disable bit (1 or 0) given the address and input number.
EI(saddr as string, ei as integer) as integer	Station expansion discrete input value (1 or 0) given the address and input number.
FALLING(saddr as string, ai as integer) as integer	Station analog input falling (1 or 0) given the address and input number.

FR(saddr as string, fr as integer) as double	Station flow rate value given the address and input number.
FRFALLING(saddr as string, fr as integer) as integer	Station flow rate falling bit (1 or 0) given the address and input number.
FRHIGH(saddr as string, fr as integer) as double	Station flow rate high setpoint given the address and input number.
FRHIGHALARM(saddr as string, fr as integer) as integer	Station flow rate high alarm bit given the address and input number.
FRLOW(saddr as string, fr as integer) as double	Station flow rate low setpoint given the address and input number.
FRLOWALARM(saddr as string, fr as integer) as integer	Station flow rate low alarm bit given the address and input number.
FRRISING(saddr as string, fr as integer) as integer	Station flow rate rising bit (1 or 0) given the address and input number.
FT(saddr as string, ft as integer) as double	Station flow total value given the address and input number.
FT24(saddr as string, ft as integer) as double	Station 24hr flow total value given the address and input number.
FT24FALLING(saddr as string, ft as integer) as integer	Station 24hr flow total falling bit given the address and input number.
FT24HIGH(saddr as string, ft as integer) as double	Station 24hr flow total high setpoint given the address and input number.
FT24HIGHALARM(saddr as string, ft as integer) as integer	Station 24hr flow total high alarm bit given the address and input number.
FT24LOW(saddr as string, ft as integer) as double	Station 24hr flow total low setpoint given the address and input number.
FT24LOWALARM(saddr as string, ft as integer) as integer	Station 24hr flow total low alarm bit given the address and input number.
FT24RISING(saddr as string, ft as integer) as integer	Station 24hr flow total rising bit given the address and input number.
FTFALLING(saddr as string, ft as integer) as integer	Station flow total falling bit given the address and input number.
FTRISING(saddr as string, ft as integer) as integer	Station flow total rising bit given the address and input number.
HIGH(saddr as string, ai as integer) as double	Station analog input high setpoint given the address and input number.
HIGHALARM(saddr as string, ai as integer) as integer	Station analog input high alarm bit given the address and input number.
HIHI(saddr as string, ai as integer) as double	Station analog input high-high setpoint given the address and input number.
HIHIALARM(saddr as string, ai as integer) as integer	Station analog input high-high alarm bit given the address and input number.

LABELS(saddr as string, itype as string, inum as integer, lname as string) as string	Station labels and other information given the input type, number and label name. (Inputs types are AI, DI, EI, FR, FT, AO and HOA. The label names correspond to the labels at the top of each station setup panel. For instance, the analog inputs would be: Name, Range, Preset etc.)
LOLO(saddr as string, ai as integer) as double	Station analog input low-low setpoint given the address and input number.
LOLOALARM(saddr as string, ai as integer) as integer	Station analog input low-low alarm bit given the address and input number.
LOS(saddr as string, ai as integer) as integer	Station Loss Of Signal bit (1=LOS) given the address and input number.
LOW(saddr as string, ai as integer) as double	Station analog input low alarm setpoint given the address and input number.
LOWALARM(saddr as string, ai as integer) as integer	Station analog input low alarm bit given the address and input number.
NDS(saddr as string) as integer	Returns a 1 whenever the station data is less than 6 seconds old.
PCHOA(saddr as string, pump as integer) as integer	Station PC HOA position given the address and pump number. (0=OFF, 1=HAND, 2=AUTO)
RATE(saddr as string, ai as integer) as double	Station analog input falling rate alarm setpoint given the address and input number.
RATEALARM(saddr as string, ai as integer) as integer	Station analog input falling rate alarm bit given the address and input number.
RISERATE(saddr as string, ai as integer) as double	Station analog input rising rate alarm setpoint given the address and input number.
RISERATEALARM(saddr as string, ai as integer) as integer	Station analog input rising rate alarm bit given the address and input number.
RISING(saddr as string, ai as integer) as integer	Station analog input rising (1 or 0) given the address and input number.
StationAddress(sname as string)	Returns a station address given the station name.
StationName(saddr as string)	Returns a station name given its address.
SYSHOA(saddr as string, do as integer) as integer	Station System HOA position given the address and pump number. (0=OFF, 1=HAND, 2=AUTO)
TimeStamp(saddr as string) as string	Station Data Time Stamp (12-hour clock formatted string)
TimeSDataAge(saddr) as integer	Returns the data age (in seconds) for the given station address
TimeSHours(saddr as string) as integer	Returns the Time Stamp Hours given the station address
TimeSMinutes(saddr as string) as integer	Returns the Time Stamp Minutes given the station address
TimeSSeconds(saddr as string) as integer	Returns the Time Stamp Seconds given the station address
VDS(saddr as string) as integer	Station Valid Data Signal bit (1=Valid) given the address and input number.

SCADAVIEW CSX Miscellaneous Functions

Function Definition	Description
AlarmAck	Tells SCADAVIEW CSX to acknowledge all alarms.
AlarmCount as integer	Returns the number of active alarms.
AlarmHorn as boolean	Returns true if there are any unacknowledged alarms (alarm horn is on).
AppRunning as boolean	Returns False when SCADAVIEW CSX is being shut down. Use this to cancel long loops or continuously running scripts.
Beep	Plays the default beep sound.
BitSet(wval as double, bnum as integer, bval as integer)	Sets a bit in the given word to a given value and returns the result.
BitTest(wval as double, bnum as integer) as integer	Tests a bit number in the given word and returns the result.
BoolToInt(bval as boolean) as integer	Returns an integer "0" or "1" based on whether the given boolean value is "false" or "true".
CSXBackupServer as boolean	Returns True if SCADAVIEW CSX is set to run or is currently running as a backup server.
CSXClientMode as boolean	Returns True if SCADAVIEW CSX is currently running as a client.
CSXServerMode as boolean	Returns True if SCADAVIEW CSX is currently running as a server.
CurrentDate(fmt as integer) as string	Returns today's date string given the desired format: 1=ShortDate, 2=LongDate, 3=SQLDate format (YYYY-MM-DD). Given no fmt parameter it will return the ShortDate.
CurrentTime(fmt as integer) as string	Returns the current time string given the desired format: 1=ShortTime, 2=LongTime, 3=SQLTime (HH:MM:SS). Given no fmt parameter it will return the ShortTime.
CurrentTimeZoneOffset as string	Returns the current GMT time zone offset string with the format: -HH:MM (or +HH:MM)
FileAppend(fname as string, writestr as string)	Adds the given string to a file given the filename (files are always in the "Script Output" folder inside the History folder)
FileCopy(fname1 as string, fname2 as string)	Copies one file to another given the two named files.
FileDelete(fname as string)	Deletes a file given the filename.
FileExists(fname as string) as boolean	Returns True if the given file exists.
FileRead(fname as string) as string	Returns the entire file contents as a string.
FileWrite(fname as string, writestr as string)	Writes the entire string to the given file.
FirstPass as boolean	True when SCADAVIEW CSX first runs the script.
GotoNextScreen	Changes main graphics window to the next screen
GotoPrevScreen	Changes main graphics window to the previous screen
GotoScreenName(scname as string)	Changes main graphics window to the given screen name

GotoScreenNum(scrnum as integer)	Changes main graphics window to the given screen number
GTagProperty(scrname as string, objname as string, propname as string) as string	Returns or sets a property value for any graphics screen tag. The tag object must be named and the property name will match what appears in the graphics editor property window.
GTagRedrawAll	This will force a redraw of all the graphic screen tags. This may be useful after property values are changed.
GTagScreenCount as integer	Returns to total number of graphics screens.
GTagScreenName(scrnum as integer) as string	Returns the graphics screen name given the screen number (1-Screen-Count).
GTagScreenType(scrnum as integer) as integer	Returns the graphics screen type (0=normal, 1=popup, 2=clone) given the screen number.
GTagScreenTagCount(scrnum as integer) as integer	Returns the total number of tags for a given graphics screen number.
HTTPRequestPage(sck as integer, url as string [, method as string])	Opens an HTTP protocol connection to the given url and requests the web page. The socket number must be in the range of 0-32. The optional method parameter can be "GET","POST","OPTIONS","HEAD","PUT" etc. as per RFC 2616 describing the HTTP 1.1 protocol. If omitted, the "GET" method will be used: Example: HTMLRequestPage(1,"http://www.micro-comm-inc.com/index.html")
HTTPPageReceived(sck as integer) as string	Returns the latest web page (string data) received after using the HTTPRequestPage function.
IntToBool(ival as integer) as boolean	Returns a boolean "false" or "true" based on whether the given integer value is "0" or "non-zero".
KeyPressed as string	Returns the last key pressed in SCADAVIEW CSX (function keys will be returned as F1,F2 etc.)
LaunchFile(filepath as string)	Runs the given program file, opens the given folder name or launches the given file with it's default application.
LaunchReports	Runs the Reports CSX application.
LaunchTrend(penfilename as string)	Runs the Trend CSX application which will then load the given pen file.
LaunchSTrend	Runs the Single-Pen Trend CSX application.
LogMessage(lnum as integer, msg as string)	Logs a custom message to the given SCADAVIEW CSX log number (1=alarm, 2=status, 3=setpoints, 4=security, 5=scadadial, 6=system)
MonthNumDays(year, month) as integer	Returns the total number of days in month given the year and month.
MouseX as integer	Current X location of the mouse cursor (in pixels) relative to the upper left corner of the primary screen.
MouseY as integer	Current Y location of the mouse cursor (in pixels) relative to the upper left corner of the primary screen.
MyLANIP as string	Returns the current LAN IP address of this machine.
MyWANIP as string	Returns the current WAN IP address of this machine.
OSFreeDiskSpace(pathnum)	Returns the amount of free space in Gigabytes for an optional path number (0=setup folder, 1=primary history, 2=secondary history) as reported by the operating system. The default path is the primary history folder.

OSFreeMemory	Returns the available RAM memory in Megabytes. This value will mean different things depending on the operating system.
OSR(bval as boolean, osrnum as integer) as boolean	One-shot rising function. This function will return True only once whenever the boolean bval parameter goes from false to true
OSR(ival as integer, osrnum as integer) as boolean	One-shot rising function. This function will return True only once whenever the ival parameter goes from 0 to non-zero
PLCDiagValue(plcnum as integer, param as integer) as double	Returns a PLC diagnostic value given the plc # and the requested parameter (1=Update Rate (msec), 2=Total Messages, 3= Poll Time (sec), 4=Reads, 5=Read OKs, 6=Writes, 7=Write OKs, 8=Connection Fails, 9=Timeouts, 10=Status Errors, 11=Percent Done, 12=TxBytes, 13=RxBytes)
PLCName(plcnum as integer)	Returns the name of the PLC (or ip address if not named) for the requested plc # (numbers starting with 1 - as listed in the SV-PLC diagnostics screen)
PlayAlarmSound(num as integer)	Plays the given alarm horn sound number (1=Main, 2=Pump Fail, 3=LOS, 4=Levels, 5=Status)
PlaySoundFile(fname as string)	Plays the given sound file name. The sound file needs to be in the "Alarm-Sounds" folder located in SCADAvieW CSX programs folder.
Print(msg as string)	Prints a line of text to the script console - normally used for debugging purposes.
PrintScreen	Prints the current main graphics viewer window.
RadioDiagReportHTML as string	Returns an HTML source string containing a report for all the CTU32 stations that were selected to collect radio diagnostics.
RadioDiagValue(saddr as string, param as integer) as double	Returns a CTU32 radio diagnostic value given the station address and the requested parameter (1=port, 2=type, 3=timeout, 4=antenna, 5=MR, 6=MW, 7=Done, 8=Fails, 9=Percent Done)
ReportWriteCSV(repname as string, headcsv as string, datacsv as string)	Appends a given comma-separated line of text as well as the current date and time to the given report name. The headcsv will be written to the first line if the file does not yet exist. Reports are stored in the history folder's "ScriptReports" folder. Example: ReportWriteCSV("Test Report", "Tank LevelFEET, Discharge PressurePSI, Suction PressurePSI", format(AI("TH", 1), "##0.0")+", "+format(AI("TH", 1), "##0.0")+", "+format(AI("PH", 2), "##0.0"))
RunScript(fname as string, sparams as string)	Runs another script given the script filename and parameters string.
SaveScreen(scname as string, pzoom as single, fname as string)	Saves a snapshot of the given graphics screen (jpeg file) to the Script Output folder. Use the pzoom parameter to zoom the picture from 1 to 100%.
SCADAdialStatus as string	Returns the latest status message string from SCADAdial CSX (if installed and enabled)
Scale(dval as double, minraw as double, maxraw as double, minscl as double, maxscl as double) as double	Scale the given dval variable given the min/max parameters.
ScriptParams	Parameters string which can be passed in from the Run Script graphics action or the RunScript function.
SecurityLogin	Show the security login window.
SecurityLogout	Logs the current user out.
SecurityRUserLevel as integer	Returns the remote level of the current user (0=none ,9=Operator ,99=Supervisor, 999=Admin)

SecurityUserLevel as integer	Returns the local level of the current user (0=none, 9=Operator ,99=Supervisor ,999=Admin)
SecurityUserName as string	Returns the name of the current user
SecurityUserNum as integer	Returns the index number of the current user
SendEmail(emailaddr as string, subject as string, msg as string)	Sends an email message given the email address, subject and text. The server used must be set up with SCADAview CSX Studio Reports Email Scheduling options. The message should be plain text.
SendEmailFile(emailaddr as string, subject as string, msg as string, fname as string)	Sends an email message given the email address, subject, message and file name for attachment. The server used must be set up with SCADAview CSX Studio Reports Email Scheduling options. The text message is encoded as plain text and the attached file must be found in the Script Output folder.
SendEmailHTML(emailaddr as string, subject as string, html as string)	Sends an email message given the email address, subject and html source text. The server used must be set up with SCADAview CSX Studio Reports Email Scheduling options. The text message can be plain text or HTML source - css styles will be fixed for proper display in email client applications.
SetupFileDownload(sfile as string, allfiles as boolean)	Downloads the requested setup file or all setup files from the SCADAview CSX server. Example: SetupFileDownload("CSX Stations.svxml",false)
SetupFileUpload(sfile as string, allfiles as boolean)	Uploads the requested setup file or all setup files to the SCADAview CSX server. Example: SetupFileUpload("CSX Stations.svxml",false)
SetXXBIT(bnum as integer, bval as integer)	Sets or clears a bit in the CTU32 XXbyte (utility byte) given a bit number and value. This shows up at PMEM(110) in a Micro-Comm PLC.
ShellExec(cmdstr as string)	Executes the given command-line DOS or Unix commands.
ShowControlGroup(cg as integer, more as boolean, x as integer, y as integer)	Opens a single control group window given the group number and x,y location. Use special x,y coordinates of 0,0 to center this window in the main window. If the "more" parameter is true then access to the time clock controls and level enables will be available.
ShowControlGroups(cg as integer)	Opens the main control groups window given the group number.
ShowCustomReport(repnum as integer)	Opens the custom daily report window given the report number to show.
ShowDailyPumpReport(saddr as string)	Opens the daily pump report window given the station address to show.
ShowHighLows(saddr as string, x as integer, y as integer)	Opens the High-Low Alarms setpoint entry window given the station address and x,y location. Use special x,y coordinates of 0,0 to center this window in the main window.
ShowHOA(saddr as string, hoa as integer, x as integer, y as integer)	Opens the Single HOA Graphic window given the station address and hoa number and x,y location. Use special x,y coordinates of 0,0 to center this window in the main window.
ShowHOAs(saddr as string, x as integer, y as integer)	Opens the All HOAs window given the station address and hoa number and x,y location. Use special x,y coordinates of 0,0 to center this window in the main window.
ShowAlertBox(title as string, msg as string, flash as boolean, x as integer, y as integer)	Opens a new Alert Box window with a given title and user message with a red background color that can optionally flash. Use x,y coordinates of 0,0 to center the alert box window in the main window.
ShowMsgBox(title as string, msg as string, x as integer, y as integer)	Opens a new generic Message Box popup window with a given title and user message. Use special x,y coordinates of 0,0 to center the message box window in the main window.

ShowPCP(saddr as string, do as integer, x as integer, y as integer)	Opens the Pump Control Panel HOA window given the station address and hoa number. Use x,y coordinates of 0,0 to center the Pump Control Panel window in the main window.
ShowPopupTemplate(scrname as string, replacelist as string, title as string, x as integer, y as integer [, sclperc as double])	Opens a popup window given the name, replacement list and title. Use x,y coordinates of 0,0 to center this window in the main window or use the saved position. The popup window can optionally be scaled to a given percentage using the sclperc parameter.
ShowPopupWindow(scrname as string, x as integer, y as integer [, sclperc as double])	Opens a popup window given the name. Use x,y coordinates of 0,0 to center this window in the main window or use the saved position. The popup window can optionally be scaled to a given percentage using the sclperc parameter.
ShowRemoteSetpoints(saddr as string, x as integer, y as integer)	Opens the Remote Setpoints window given the station address. Use special x,y coordinates of 0,0 to center this window in the main window.
ShowStation(saddr as string)	Opens the Station Display window to the given station address.
ShowStationNotes(saddr as string, x as integer, y as integer)	Opens the Station Notes window given then station address. Use special x,y coordinates of 0,0 to center this window in the main window.
ShowSystemDisplay(display as integer)	Open the system display given the number (1-3)
ShowTimedReport	Opens the custom timed report window.
ShowTrend(pens as string [, year as integer, month as integer, day as integer, ndays as integer, shour as double, ehour as double])	Show the built-in trend window and load the given pen file.
The "pens" parameter can also be a comma-separated string formatted: StationName, PenName, yMin, yMax (for each pen)	
Other optional parameters include the starting date, number of days and x-axis start and end hours.	
ShowRTrend(penfile as string)	Show the built-in real-time trend window and load the optional pen file.
ShowSTrend	Show the built-in single-pen trend window.
ShowHTML(fname as string)	Show the built-in HTML Viewer and open the given file name.
ShowURL(urlstring as string)	Show the built-in HTML Viewer and move the given URL. (i.e. http://www.micro-comm-inc.com/)
ShowWindow(windowname as string)	Shows a SCADAvie CSX window given the name (i.e. ShowWindow("Active Alarms").
Sleep(msec as integer)	Pauses processing the script for a given number of milliseconds. Use this in long loops or continuously running scripts to give up processor time to other threads.
SpeakText(msg as string)	Uses Mac OS X or Windows built-in speech engine to speak the given text message.
SlideshowStart	Starts slideshow mode on the main graphics window
SlideshowEnd	Ends slideshow mode on the main graphics window
SlideshowSpeed(nsecs as double)	Sets the slideshow speed (delay between screens) to the given number of seconds

SOAPInitialize(sck as integer, wsdlURL as String, actionURL as string, methodURL as string)	Sets up a SOAP connection given a socket connection # and string parameters for the WSDL document (Web Services Description Language), the action and the method URLs.
SOAPParameterBoolean(sck as integer, paramName as String, paramValue as boolean)	Set the given parameter name to a given boolean value.
SOAPParameterInteger(sck as integer, paramName as String, paramValue as integer)	Set the given parameter name to a given integer value.
SOAPParameterDouble(sck as integer, paramName as String, paramValue as double)	Set the given parameter name to a given floating point value.
SOAPParameterString(sck as integer, paramName as String, paramValue as string)	Set the given parameter name to a given string value.
SOAPRequest(sck as integer, operation-Name as string)	Sends the SOAP request given an operation name string.
SOAPResult(sck as integer, paramName as string) as string	Returns the SOAP result message given a result parameter name. Values are always returned as a string.
SOAPErrorMessage(sck as integer) as string	Returns the SOAP error message if an error occurred during the request.
SQLDate(yyyy as integer, mm as integer, dd as integer) as string	Formats the given date in SQL date format, YYYY-MM-DD
SQLDateTime(yyyy as integer, mm as integer, dd as integer, hr as integer, mn as integer, sc as integer) as string	Formats the given date and time in SQL date-time format, YYYY-MM-DD HH:MM:SS
SQLExecute(sql as string)	Executes a given SQL database string (uses the global SQL database server setup even if not enabled).
SQLSelect(sql as string) as string	Executes a given SQL select string and returns the result as a comma-separated list with CR line endings
StartCSXSetup(spath as string)	Changes the setup folder to the given path and restarts SCADAvie CSX. Example: StartCSXSetup("C:\MICROCOM2")
TCPConnect(sck as integer, ipaddr as string, ipport as integer)	Opens a TCP/IP Socket connection to the given ip address or hostname and ip port number. The socket number must be in the range of 0-32.
TCPConnectTest(sck as integer, ipaddr as string, ipport as integer, testperiod as integer, timeout as integer) as integer	Tries to open a TCP/IP Socket connection to the given ip host and port and returns 1 if the latest test was successful. Testing is done every testperiod and will fail if no connection is established within the timeout. The testperiod and timeout parameters are in seconds.
TCPDisconnect(sck as integer)	Closes the specified TCP/IP Socket connection (if connected).
TCPIsConnected(sck as integer) as boolean	Returns whether or not the socket connection has been successful. It may take a while for connections to be established, so this function should be used to test a connection before sending data.
TCPRead(sck as integer) as String	Reads all incoming data from a socket connection (if connected).
TCPWrite(sck as integer, senddata as string)	Sends the given data string out the socket connection (if connected).

Time(param as integer) as integer	Returns the current date or time value given the param (1=DayOfWeek, 2=Month, 3=Day, 4=Year, 5=Hour, 6=Minute, 7=Second)
TSEC(index as integer) as integer	Timer variables in seconds which count down to zero. Index can be 0-100.

SCADAviiew CSX Global Array Variables

Note: Values will be retained in memory after a script is run but will not be saved whenever SCADAviiew CSX shuts down.

Use file functions to load/save any variables that need to survive startup/shutdown.

These variables can also be synchronized with the CSX server when running on a client. This option is selected in the Client/Server Startup page in CSX Studio.

Variable	Description
B(index as integer) as boolean	Global boolean variable array B(0) through B(500)
M(uloc as integer) as integer	User memory variables (integers) stored in user memory tags on Micro-Comm CTU32 protocol PLCs. The uloc range is 0-999. Note: When no CTU32 PLC is available these will only be stored in memory.
S(index as integer) as string	Global string variable array S(0) through S(500)
X(index as integer) as integer	Global integer variable array X(0) through X(500)
Y(index as integer) as double	Global double variable array Y(0) through Y(500)

User Defined Global Variables

Variables may also be defined using the “Global Vars” button on the script editor. These can be saved/loaded automatically by using the “Retentive” checkbox.

Name	Description	Type	Retentive	Log	Value	Units	TrendMin	TrendMax
TestDouble1		Double	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0			
TestInteger1		Integer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0			
TestBoolean1		Boolean	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	False			
TestString1		String	<input checked="" type="checkbox"/>	<input type="checkbox"/>	This is a ...			
Visibility		Integer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0			
ReportYear		Integer	<input type="checkbox"/>	<input type="checkbox"/>	0			
ReportMonth		Integer	<input type="checkbox"/>	<input type="checkbox"/>	0			

Buttons: +, -, Up, Dn, Duplicate, Close, Save

PLC Data References

SV-PLC Server: PLC Connections - Ethernet or Serial

Accessed using the “PLC” tab in station or group setup, the connection can be either an ethernet IP address, hostname or a serial port setting string.

PLC Connection Examples:

192.168.3.194 - simple IP address

192.168.3.194;1 - a semi-colon at the end can specify an optional connection # (multiple connections to a a single PLC address)

192.168.10.117,8 - use a comma at the end to specify the slot # for a ControlLogix processor card (default is zero)

192.168.3.194\DHPx - use \DHPx at the end for a DH+ Gateway where x is the DH+ node ID (in decimal)

192.168.3.194:4002 - specifies the port number instead of using the default port for the protocol

COM1,9600,N,8,1 - serial port, baud rate, parity, databits, stopbits

SV-PLC Server: Referencing PLC Data

DF1 References (DF1, SLC or CLX Protocols)

SLC style DF1 locations are referenced by File Type, File # : Offset and optional / Bit #.

Integer, Bit, Timer, Counter and Float file types are supported.

Timers and counters with field references are supported for certain locations.

(analog inputs, analog outputs or control group stop/starts)

Input and Output module files are supported as well as the status file.

SLC Examples:

N7:0

N7:0/1

B3:0/15

F8:20

T4:0.ACC

T4:0/13

C5:0.PRE

S2:4

I:0.1

O:1/0

CIP Data Table References (CLX Protocol)

Arrays are referenced by the data type followed by the array name or UDT enclosed in parentheses.

The array element number follows a “:” and the optional bit reference follows a “/”.

Integer, Double-Integer, Float, Small-Integer and Boolean array types are supported (dtN,dtD,dtF,dtS and dtB).

Note: Bool arrays are referenced using the 16bit word#/bit# instead of the actual element number.

CLX Examples:

dtN(TestIntData):0

dtN(TestIntData):0/3

dtD(TestDIntData):10

dtF(TestFloatData):20

dtB(TestBoolData):0/3

dtD(TestUDTName.PropertyName):0

dtS(TestUDTName.PropertyArray):8

dtD(TestUDTArray[1].PropertyName):0

Modbus References

Modbus data locations are referenced using the register type follow by “x”

and then followed by the offset and optional / bit number.

Supported types:

Holding Registers (4x), Input Registers (3x), Coils (0x) and Discrete Inputs (1x).

Floats are also supported and can be derived from either 4x or 3x registers.

(2 words in either MSW,LSW or LSW,MSW order)

Fx = float from 4x holding registers MSW,LSW

Rx = float from 4x holding registers LSW,MSW

Qx = float from 3x input registers MSW,LSW

Zx = float from 3x input registers LSW,MSW

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Modbus Examples:

4x100

3x1

4x100/1

1x1

Fx100

Rx100

Signed Integer PLC References

Normally all 16bit registers from a PLC are assumed to be an unsigned integer.

By using a Preset = -32768, SCADAview CSX will treat it like a signed integer.

Floating Point PLC References

Floating point values from a PLC used for analogs are normally un-scaled to a 16bit integer for use in SCADAview CSX. This means that the displayed range of values will depend on the range and preset values used. (divide by the Range, subtract the Preset -> 16bit integer)

(Larger values are possible in a Flow Totals since they are un-scaled to a 32bit integer)

If, however, a Range of 1 and a Preset of 0 is used for a floating point reference, the value will be passed "as is" to SCADAview CSX without being un-scaled first.

In this case when the floating point reference needs to be scaled, a PLC expression should be used.

Examples:

Range = 1 and Preset = 0, values can be any floating point number

Range = 0.1 and Preset = -32768, values can be -3276.8 to 3276.7

Range = 0.1 and Preset = 0, values possible are 0 to 6553.5

Range = 0.01 and Preset = 0, values possible are 0 to 655.35

PLC Expressions

Expressions using PLC references can also be used for station data (not for group data).

PLC data references inside the expressions are enclosed in square brackets [].

Note: Expressions for analogs will result in a scaled value that is then converted back to raw values for SCADAview CSX. This means you will need to scale the PLC raw values within the expression.

Expression Operators and Functions

Name	Description
+	Addition
-	Subtraction
*	Multiply
/	Divide
%	Remainder
^	Bitwise XOR
&	Bitwise AND
	Bitwise OR
<	Less Than

>	Greater Than
<=	Less Than or Equal To
>=	Greater Than or Equal To
==	Equal To
◇	Not Equal To
!	Not
()	Left and right parentheses (for functions or to force order of operation)
IF(x, y, z)	If x is > 0 then returns y else returns z
TIME(x)	returns a time or date value depending on the x parameter - 1: day of week (1=SUN), 2:Month 1-12, 3:Day 1-31 4:Year, 5:Hours 0-23, 6:Min 0-59, 7:Sec 0-59
SIN(x)	Sine (angles are in degrees)
COS(x)	Cosine
TAN(x)	Tangent
ASIN(x)	Arcsine
ACOS(x)	Arccosine
ATAN(x)	Arctangent
LOG(x)	Natural logarithm
INT(x)	Integer portion (rounds down to nearest)
POW(x,y)	Raise to power (x raised to y power)
SQR(x)	Square-root
SGN(x)	Sign (-1 when x<0, 1 when x>0, 0 when x=0)
FTC(#,value,secs)	Fail to change will return a 1 whenever the given value has not changed in the given number of secs. The # can be 1-64.

DF1 Examples:

[N7:0]*0.1+[N7:1]*0.1
 ([N7:0]+[N7:1]+[N7:2])/30
 [B3:0/0][B3:0/1]
 [B3:0/0]&[B3:0/1]
 SIN([F8:0])
 COS([F8:1])
 FTC(1,[N7:0],10)

CIP Data Table Expressions:

[dtN(TestIntData):0/3][dtN(TestIntData):0/4]
 [dtN(TestIntData):1]+[dtN(TestIntData):2]

Modbus Examples:

[4x104]+[4x105]-100
 [1x1][1x2]

Station and Control Group Data Expressions

Station and group data can also be referenced and used for station data - these expressions can also be used with CTU32 protocol.

Station Data References:

Always begin with the station address HH-WW (shown as “xx” in examples below) followed by an underscore “_”. Analog Inputs/Outputs and Discrete Inputs/Outputs are always followed by the input # (shown always as a “1” below).

Variable Name	Description
xx_LOS	Station Loss Of Signal (1=LOS)
xx_DI1	Discrete Input Value (1=ON)
xx_EI1	Expansion Input Value (1=ON)
xx_AI1	Analog Input Value
xx_AO1	Analog Output Value
xx_DO1	Discrete Pump Call Status (1=CALL)
xx_DO1_CALL	(same as above)
xx_DO1_RUN	Pump Run
xx_DO1_FAIL	Pump Fail
xx_DO1_DSBL	Pump Disabled Status
xx_DO1_SHAND	Pump System HOA HAND (1=HAND)
xx_DO1_SAUTO	Pump System HOA AUTO (1=AUTO)
xx_FR1	Flow Rate Value
xx_FT1	Flow Total Value

Examples:

[PH_AI1]
[TH_AI2]
[PI_DO1_CALL]
[PI_DO1_FAIL]
[PH_AI1]+[PH_AI2]
([PH_AI1]+[PH_AI2]+[PH_AI3])/3
[TH_DI1]|[TH_DI2]
[TH_DI1]&[TH_DI2]

Group Data References:

Always begin with “G” followed by a group number 1-255 (shown as “n” below) and then followed by an underscore “_”. Stop/starts and analog disables are followed by the setpoint number (shown always as a “1” below).

Variable Name	Description
Gn_STOP1	Stop Setpoint (STOP9=Override Stop)
Gn_START1	Start Setpoint (START9=Override Start)
Gn_RESET	Group Reset Status (1=resetting)
Gn_ALTFWD	Alternator Forward Bit
Gn_ALTREV	Alternator Reverse Bit (both bits are set for AUTO)
Gn_PREFILL	Prefill Rate
Gn_TIHR	Time Inhibit Hours
Gn_TIMN	Time Inhibit Minutes
Gn_TRHR	Time Restore Hours
Gn_TRMN	Time Restore Minutes
Gn_ADISABLE1	Analog Disables 1-8 (1=disabled)

Examples:

[G1_STOP1]
[G2_PREFILL]
[G1_ADISABLE2]

Data Expressions

Station Data Expressions are evaluated whenever a station's data changes and are used for custom calculations, moving data or other special purposes.

Expressions can also be used in graphic screen tags. Graphic Tags will normally get data directly from stations or groups. They can also get data from a special tag station source "FN Built-In Function". The Tag Data source can then be either EXA or EXD for analog or discrete expressions. Expressions can use station data variables, script global variables, control group data, operators and/or functions to return a value. Numbers used in all expressions are internally stored as double precision floating-point.

Graphic tags can also use script global array variables - B(),M(),X(),Y() as well as any user defined global variables.

In addition to the analog and discrete expressions, the following special "Static Text" messages are available:

TIME\$ - will display a short format time string (HR:MN AP).

DATE\$ - will display a short format date string (MM-DD-YYYY).

xxNAME\$ - display station name where xx is the station address.

GxxxNAME\$ - display group name where xxx is the group address.

LABELS\$(saddr,itype,inum,ltype) - used to display any station label (see the CSX Script LABELS function).

SCREENNAME\$ - used to display the graphic screen name.

Note: These special strings are entered in the graphic tag "Static Text" property.

Examples:

PHNAME\$ - to display the station name for address PH

LABELS\$(PH,DI,1,NAME) to show the input name for station PH, discrete input 1

LABELS\$(PH,AI,1,UNITS) to show the units label for station PH, analog input 1

Operators and Functions

Name	Description
+	Addition
-	Subtraction
*	Multiply
/	Divide
%	Remainder
^	Bitwise XOR
&	Bitwise AND
	Bitwise OR
<	Less Than
>	Greater Than
<=	Less Than or Equal To
>=	Greater Than or Equal To
==	Equal To
<>	Not Equal To
!	Not
()	Left and right parentheses (for functions or to force order of operation)
FULEV()	Security User Level (9=oper,99=super,999=admin)

FUNUM()	Security User Number (0=no one logged in)
FBMSK(b0,b1,b2...)	Returns an integer value with bits set as given in the parameters. Bit order b0,b1,b2,b3,b4 up to 16 total bits
FBTST(x,n)	Tests bit #n in expression x
FABS(x)	Absolute Value
FTIME(x)	computer time or date value depending on the x parameter - 1: day of week (1=SUN), 2:Month 1-12, 3:Day 1-31 4:Year 0-99, 5:Hours 0-23, 6:Min 0-59, 7:Sec 0-59
FSIN(x)	Sine (angles are in degrees)
FCOS(x)	Cosine
FTAN(x)	Tangent
FASIN(x)	Arcsine
FACOS(x)	Arccosine
FATAN(x)	Arctangent
FLOG(x)	Natural logarithm
FINT(x)	Integer portion (rounds down to nearest)
FPOW(x,y)	Raise to power (x raised to y power)
FSCL()	Scale - parameters are (x, minraw, maxraw, minscl, maxscl)
FSQR(x)	Square-root
FSGN(x)	Sign (-1 when x<0, 1 when x>0, 0 when x=0)
FIF(x, y, z)	If x is non-zero (true) then it will return y else it returns z
FSELECT(x, v1, y1, v2, y2 [, v-n, y-n])	If x is equal to v1 it will return y1, if x equals v2 it returns y2 and so on. If no value is found it returns 0.
FHASLABEL(saddr,ltype,lnum,Ltype[,label])	Discrete function that returns a 1 if a station's label (given the input type, input number and label type) is not blank or optionally if it matches a given label. Example: FHASLABEL(PH,DI,1,Name) Note: Inputs types are AI, DI, EI, FR, FT, AO and HOA. The Ltype corresponds to the name of the label column at the top of the station setup panel. For instance, the analog inputs would have Name, Range, Preset etc.

Examples

PHFR+PIFR+PJFR
(adds together 3 station's flow rates)

THAI1-TIAI1
(compute the difference between 2 tank levels)

(THAI1+THAI2)/2
(averages the first 2 analog inputs at TH)

G010SP3>120
(discrete expression for group #10 = 1 if stop setpoint is above 120)

FIF(THAI1>100,1,0)
(discrete expression returns a 1 if station TH analog input is greater than 100)